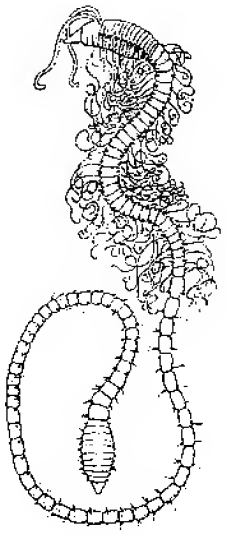
May, 1995 SCAMIT Newsletter Vol. 14, No.1

NEXT MEETING:	SCBPP Problem Non-polychaete and Polychaete Species
GUEST SPEAKER:	none
DATE:	June 12 and June 19
TIME:	9:30am - 3:30pm
LOCATION:	See below

JUNE 12 & 19 MEETINGS

The non-polychaete taxa meeting will be held on 12 June in the Times-Mirror Room of the Los Angeles County Museum of Natural History. Eusirid (particularly *Rhachotropis*), phoxocephalid (particularly *Heterophoxus*), and ampeliscid amphipods will be the topic. Other SCBPP non-polychaete taxa not already discussed are also welcome, and will be addressed as time permits.

The polychaete meeting will be on June 19 at MEC (Marine Ecological Consultants) in Carlsbad. If you need a map please contact the secretary. This will be the last meeting for SCBPP problem polychaetes species. The



(*Aphelochaeta monilaris* from Hartman 1960)

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SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

next meeting will be spent dealing with problems from the SCBPP QC reanalysis.

Will all members attending either meeting please bring a list of their SCBPP encountered species so that they may be incorporated into a master species list. Multiple copies for group distribution would be greatly appreciated.

1995 SCAS MEETINGS

The 1995 Southern California Academy of Sciences meetings were held 5-6 May on the campus of California State University, Fullerton. A number of SCAMIT members presented papers, although the focus was on ecology rather than taxonomy in most cases. Included were:

"Ascidian Introductions into Southern California Harbors" - Gretchen & Charles Lambert, CSU Fullerton

"Sediment Contaminants and Toxicity in Southern California: Assessment of Multivariate Techniques to Determine Biological Impact" - C.L. Maxon, Doug Diener, and Art Barnett, MEC Analytical Systems.

"Embryo Development Bioassays for Assessment of Stormwater Effluent Toxicity Using Marine and Freshwater Fish" - L. Skinner, A. de Peyster, & Ken Schiff, CSU San Diego & Kinnetic Laboratories

"Observations of Oceanic Processes and Water Quality Following Seven Years of CTD Surveys in Santa Monica Bay" - Ann Dalkey & John Shisko, EMD City of Los Angeles

"San Diego Regional Storm Water Monitoring Program: Contaminant Inputs to Coastal Wetlands and Bays" - Ken Schiff, Kinnetic Laboratories

"Distribution of Total Organic Carbon and Nitrogen in Sediments of the Southern California Bight" - Mary Bergen, E. Zeng, J. McAnally, P. Garibay, & R. Hall; SCCWRP, CSDMWWD, and EPA Region IX

Since the last SCAMIT symposium held in conjunction with SCAS was several years ago, perhaps it is time to have another. Given the primarily terrestrial and freshwater focus of this years Introduced Species Symposium, it was suggested that SCAMIT might begin to organize a symposium for the 1996 SCAS meeting dealing exclusively with introduced marine invertebrates in the Eastern Pacific. Member comments and suggestions are solicited. If you think you might wish to participate, please write or phone the editor.

REFERENCE MATERIAL AVAILABLE

Through the kind offices of member Tony Chess material (primarily microcrustacean, but also some specimens from other phyla) from Albion in Mendocino County, California and from Baranof Island in Southeast Alaska will soon be available for comparison and reference. The bulk collections were sent by Tony to Don Cadien, who is currently sorting them to species. A list of the species for which material is available will be placed in the SCAMIT Newsletter within the next few months. Those members interested in getting specimens for comparison with their normal monitoring collections should either write or call Don Cadien and indicate which taxa are desired. If you use standardized containers and/or labels and would like the material placed in them, please send them to Don.

SCAMIT TAXONOMIC LIST

Members with additions, corrections, elaborations, deletions, or any modifications to the SCAMIT Taxonomic Listing of Benthic Invertebrates are again encouraged to submit these to either Ron Velarde or Dave Montagne (addresses, telephone, etc. are listed in the front of your copy of Version 1) for inclusion in the second version of the list. The modified list will be released in the summer or early fall after completion of all SCBPP taxonomy and after review of submitted changes. Make sure that any submissions are documented. Undocumented changes will not be accepted and included in the new version.

CLEARING METHODS

Don Cadien requested that members who clear specimens for identification prepare a document describing their application of clearing procedures. We may find that there are significant differences in practice between agencies, and that these may have the potential to produce different results. Most clearing procedures are very simple, so their documentation should not require too much work.

COOPERELLA'S FAMILY

Cooperella subdiaphana has recently been examined morphologically (Morton 1995), and the family Cooperellidae has been submerged in the Petricolidae as a result.

NEW LITERATURE

In a recent (1994) review of the isopod family Paramunnidae, Winkler extended the known range of *Munnogonium tillerae* south to the Straits of Magellan at the tip of South America. The paper deals exclusively with magellanic collections, however, and aside from the *M. tillerae* record, has little local applicability.

POLYCHAETE NEWSLETTERS

There are currently two newsletters available to those people working with polychaetes. One is an electronic mail news service available on the Internet. It is called ***Chaetozone***. This is a very inexpensive way to communicate with polychaete researchers and workers all over the world. A list of the latest polychaete papers is included in this newsletter along with details of interesting articles in localized journals or "grey" literature. Also ***Chaetozone*** maintains a list of polychaetologists accessible by e-mail. This newsletter will appear at two month intervals. The editor is Dr. Geoffrey B. Read of Wellington, New Zealand. To subscribe send a message by e-mail to Geoff Read at:

1. read_g@kosmos.wcc.govt.nz (preferred)
2. gread@actrix.gen.nz
3. CompuServe 100033,1332 (last resort)

Recently, several SCAMIT members received issues of *Polychaete Research* a new development of the former *Polychaete Research Newsletter*. This publication has a broader scope and includes taxonomic 'publications' for the purpose of the International Code of Zoological Nomenclature. It will still contain informal news and reports on work in progress of polychaete research, but in a separate newsletter section. Contributions in the form of short papers (4 printed pages), research notes and comments that would benefit polychaetologists working throughout the world are invited. This latest volume #16 is devoted to papers derived from the 2nd *Polychaete Colloquium and Workshop* held in Cardiff, April 1993. Reports and papers from

the 3rd workshop held last year in April at the University of Newcastle, NE England, will appear in a future edition of *Polychaete Research* as well as those papers from the 4th workshop to be held this June 12-16 at Queens University in Belfast. It is intended that one issue a year will be published. The publisher of *Polychaete Research* is:

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Also, an electronic copy of *Polychaete Research* may be obtained courtesy of Bioline Publications at: bio@biostrat.demon.co.uk.

LABEL PAPER

SCAMIT member, Leslie Harris has been keeping informed through e-mail about the wet storage label paper problem. She recently saw two useful comments regarding a replacement for Byron Weston *Resistall* and a cautionary note about using *Rite in the Rain* paper. Erik Ahlander of the Department of Vertebrate Zoology at the Swedish Museum of Natural History reported the availability of a Swedish rag paper called *Svenskt Arkiv* that has been used in the fish collection at the Swedish Museum. It is more paper-like than *Resistall*, but works very well in alcohol and formalin. It is available in two weights, viz. 80g/m3 and 100g/m3. The heavier paper has a tendency to cause paper jams in printers and has a coarser writing surface. It seems to be only available in A4 size, which is a little larger than the standard 8 1/2 X 11. It is produced and sold by:

Tumba Bruk AB
S-147 83 TUMBA
Sweden
Phone +46 8 53069500

The e-mail message regarding *Rite in the Rain* paper cautioned users against long term wet storage of this paper. It does not always hold up well. However, it was reported in the SCAMIT newsletter [13(10)] that the Kinnetics Lab in Encinitas, CA, has used this label paper for at least a decade and have experienced no problems with deterioration or ink fading so far.

INTRODUCED *Philine*

During the most recent CSDLAC trawling effort off Palos Verdes nearly twenty individuals of a *Philine* were taken which at first sight seemed to be juvenile *Philine alba*. This caused some excitement since juvenile *P. alba* had not previously been seen, although the large lenticular adults were well known and common. The animals were translucent milk white with numerous minute opaque white spots. Specimens ranged from about 15-30mm in length. They were collected, preserved in formalin without relaxation, and returned to the lab. Microscopic examination immediately revealed that we still had not seen juveniles of *P. alba*, and that what we had collected was probably *P. auriformis*.

Previous reports of *P. auriformis* in the north east Pacific have come from the San Francisco Bay complex, and from Bodega Bay on the outer coast above San Francisco. The species was described from New Zealand by Sutter around the turn of the century, and first reported in San Francisco Bay within the last decade. It's occurrence in open coastal waters at between 23 and 137m off Palos Verdes came as a shock, especially as no trace of these animals was found in January 1995 in the

previous trawl survey at the same sites.

The identity of the specimens was established by close comparison with the redescription of the species by Rudman (1970), and by direct comparison of shell, radula, and gizzard plates with specimens of *P. auriformis* from Richmond Harbor, San Francisco Bay. Tony Phillips (CLAEMD) indicated that the species had also been taken by them recently in Santa Monica Bay, but was identified only as *Philine sp. Philine auriformis* is widely distributed in New Zealand, and tertiary fossil specimens are also known. Rudman (1970) considered it to be a New Zealand endemic, although reporting a tentative record from Victoria, Australia. Given the local history of the last known introduced *Philine* (sp A), this species is expected to spread throughout the Bight, perhaps displacing other predatory cephalaspid mollusks. One dissected *P. auriformis* had a small *Melanochlamys diomedea* in it's gizzard, and eating the competition may be the adopted competitive strategy.

ANIMAL HOUSE

The same series of trawl samples turned up a most unexpected example of undocumented amphipod behaviour. A small *Nassarius* shell was collected which bore evidence of being inhabited, and was assumed to harbor a hermit crab. Since it was small, and chances for a live identification were poor, the shell was collected and preserved for examination in the laboratory. During preservation the occupants of the shell swam out; two small amphipods. It was immediately assumed that these were *Photis conchicola* for which domicoly in gastropod shells is well documented (Barnard 1962, Carter 1982). Further observation proved this not to be the case, as the amphipods were far too long to be *Photis*.

Examined in the laboratory the amphipods proved to be a pair (♂♂, and ♀♀) of *Gammaropsis* similar to or identical with *G. thompsoni*. Because of the condition of the male G2 (no defining spine on palm), these animals key to *G. tonichi* Barnard 1969 in Conlan's key to the genus (1983). Barnard's species was described from Bahia de Los Angeles in the Gulf of California, and has not previously been reported from Southern California Bight waters. If this is really *G. tonichi*, it's peculiar habitat may be responsible for the lack of records. Only the single pair was taken, at a depth of 23m. Members please keep your eyes open for small occupied gastropod shells in trawl and benthic grab samples. The aperture of the one domicile seen to date was partly occluded by a fine membrane of amphipod silk bearing light debris and fine silt. The general appearance was very similar to that seen intertidally in *Photis conchicola*-inhabited shells.

WHERE IS OCTOPUS VELIGERO?

The same March trawls found the search for field characteristics of *Octopus veligero* continuing. The crew of the CSDLAC vessel Ocean Sentinel was augmented by a visit by Megan Lilly (CSDMWWD) who is currently maintaining a series of six *O. rubescens* and two *O. californica* in tanks for observation and videotaping. Efforts were continued to gather live *O. veligero* so that key field marks could be recognized, and documented, with the identity of the animal confirmed by dissection in the laboratory. A SCBPP trawl station near the Redondo Submarine Canyon where an *O. veligero* was taken in August 1994 was retrawled twice during May, but only *O. rubescens* and *O. californica* were encountered.

Photis brevipes TYPE

In response to a SCAMIT inquiry about

Shoemaker's type(s) of *Photis brevipes* Elisabeth Nelson of the Smithsonian called to say she had located the type (a male), but had not yet checked uncatalogued material in the collection to see if some females from the Presidential Cruise collections from which the species was described could be located. She will examine these specimens to fill in the gaps in Shoemaker's original description. We should shortly have a better idea which (if any) of the west coast forms currently termed "Photis brevipes" are actually conspecific with Shoemaker's species from Bahia Magdalena on the outer coast of Baja California.

STAINING PATTERNS

A SCAMIT meeting to discuss polychaete staining patterns has been proposed for the August meeting. Included in this newsletter is a table of published accounts by various authors on polychaete staining. This was suppose to accompany the article by Tom Parker (CSDLAC) on staining patterns in the last volume. The editor apologizes for this omission.

ANOTHER NEW SCAMITteer

Congratulations are in order for Dean Pasko (CSDMWWD) and his wife, Francine. They are the proud parents of a baby boy born on May 22. They have named him Samuel Granger. He weighed in at 8 lbs. 10 oz. and was 21 inches long.

MINUTES OF MAY 8 MEETING

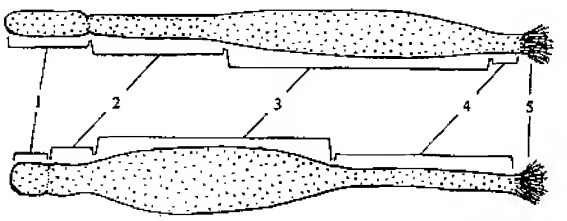
We began the meeting with a review of a videotape produced by Dean Pasko (CSDMWWD) showing a series of nemertean taxa as seen through the microscope both uncleared and cleared. In several cases Dean found that taxa he was attempting to separate at a specific (usually provisional) level were often left at generic or familial levels by other workers. This was particularly true with the three local genera of the Lineidae; *Lineus*, *Micrura*, and *Cerebratulus*. From discussions at the meeting it appeared that the generic limits of these taxa are not the same for each of the participating agencies, particularly with regard to juveniles. Since soft tissue characters such as length and depth of the cephalic grooves, size and prominence of the mouth, position and size of the proboscis pore, etc. are all subject to at least some extent to variation with degree of contraction. This variation is reduced by the use of relaxants, and common handling practices in the SCBPP project, but some degree of variablity still remains. It is probable that the treatment of these taxa in the QA sample reanalysis will demonstrate differences between original and QA analysts.

Indeed, with many nemerteans, it appears the more specimens are examined the lower becomes the confidence with which any identification can be tendered. At some point we will have to accept an inability to speciate some of the local nemerteans, and report them at a higher level.

We examined voucher specimens of three species of chaetodermatid mollusks provided by Ron Velarde. These had been identified for CSDMWWD by Dr. Amelie Scheltema. Dr. Scheltema has recently completed reexamination of many of the north east Pacific chaetodermatids as part of the Santa Maria Basin Taxonomic Atlas project. According to Ron she dealt with 18 or 19 species in that work, and has produced a key to aplacophorans from our area. When her section of the Atlas will be released is not known, but hopefully it will be before the end of the year. The three species taken off San Diego by CSDMWWD were *Chaetoderma pacifica*, *Chaetoderma marinelli*, and *Falcidens* n.sp. (we will not repeat the manuscript name

here. The latter species appears to be the same as *Falcidens* sp. *B* of Shrake from the BLM project in the late 70's.

C. pacifica appeared to be characterized by a nearly uniform diameter through all the body sections except for a slight enlargement around the mouth, and at the base of the branchiae. The midgut region also had small scales arranged somewhat haphazardly, giving a disheveled appearance. This species was called *Crystalophrisson nitidulum* var. pacifica in Schwabl (1963, figs. 17-18). Several of the SCBPP chaetodermatids from the Pt. Loma



Partition of the caudofoveate body: 1)foregut, 2)midgut, 3)digestive gland, 4)prepallial region, 5)pallial region (from Salvini-Plawen 1975)

area and from off Palos Verdes seemed to be this species.

None of the examined materials seemed to match the vouchered *C. marinelli*. Other specimens were examined from SCBPP collections, which in addition to *C. pacificum* and *Falcidens sp B*, included specimens apparently referable to *Falcidens sp A* of Shrake and *C. hancocki*.

We anxiously await the issuance of the mollusk volume of the Atlas which contains Dr. Scheltema's aplacophore section. From the portions we were privileged to examine in draft it appears that the key will depend heavily on spine complement. This may be a bit difficult for us non-specialists to use, but should prove a useful tool.

MINUTES FROM MAY 22 AND 23 MEETINGS

This two day polychaete meeting focused on cossurids and cirratulids of the *Aphelochaeta/ Monticellina* complex that were found in the SCBPP samples. At this long meeting SCAMIT members also had the chance to review the polychaete portion of vol. 4 of the MMS Atlas (Blake and Hilbig, 1994) together and make some decisions regarding the validity of these species for our area.

Also, at this meeting SCBPP samples were exchanged for QA/QC reanalysis amongst the various agencies involved in the project. This reanalysis should begin now so that we may resolve problems with any conflicting identifications as soon as possible.

The meeting opened on Monday with Tom Parker (CSDLAC) giving members an update on the taxonomy of the phyllodocid genus *Eumida*, which has had some problems with inconsistent identification amongst local species. At the end of this newsletter Tom provides a brief history and summary of this genus and includes several voucher sheets and a table to help us differentiate between species of *Eumida* and related genera.

The rest of Monday's meeting was spent examining cirratulids of the *Aphelochaeta/ Monticellina* complex. Tony Phillips (HYP) has been able to differentiate between species of this complex using methyl green staining patterns. Included in this newsletter are voucher sheets illustrating these patterns along with the other diagnostic characters that should be used to separate these species.
Most of these species will be included in an upcoming volume of the MMS atlas. At the meeting we examined different agencies' *Aphelochaeta* species and concurred that everyone had animals that were the same, but with slight variations in staining patterns. This

may be due to the fact that everyone has a different technique for staining their polychaetes. It was decided at this meeting that for purposes of the SCBPP the following names would be used in the data:

Aphelochaeta marioni (Saint-Joseph 1894)
Aphelochaeta monilaris (Hartman 1960)
Aphelochaeta sp. C Dorsey 1984
Aphelochaeta sp. 1 of Phillips (a new species to be described in the MMS atlas)
Monticellina dorsobranchialis (Kirkegaard 1959)
Monticellina tesselata (Hartman 1960)
Monticellina sp. HYP1
Monticellina sp. HYP2
Protocirrineris sp. HYP1
Protocirrineris sp. HYP2

Tony Phillips (HYP) has found two provisional species of *Monticellina* from the SCBPP samples. They have been found at 80 - 200m depth. Neither has any methyl green staining pattern. These are being referred to as *Monticellina* sp. HYP1 and *Monticellina* sp. HYP2 for now. Tony will provide voucher sheets in an upcoming newsletter. The diagnostic characters for these two species are listed below.

Monticellina sp. HYP1 -

- body color pearly white with slight iridescence
- no methyl green stain pattern either dorsally or ventrally
- posterior setigers of the pygidium are rugose or ruffled in appearance
- neurosetae are serrated, but not denticulated like *M. dorsobranchialis*
- pygidium is dorso-laterally compressed and cup-shaped
- branchiae are completely wrapped around the body

Monticellina sp. HYP2 -

- larger and more robust in size than M. sp. HYP1 with very compressed setigers anteriorly
- body color is pearly white but not iridescent
- very prominent ventral groove
- no methyl green stain pattern either dorsally or ventrally
- neurosetae are serrated like M. sp. HYP1
- missing pygidium

Anyone with *Monticellina* with these characteristics should contact Tony Phillips, as he would like to examine more specimens.

As reported in SCAMIT Newsletter vol. 13(12) an odd cirratulid in SCBPP samples that was thought to be a *Timarete* is actually a *Protocirrineris*. Tony Phillips has found two different types of *Protocirrineris* in his samples from the SCBPP. Included in this newsletter are voucher sheets describing these two types. The second was originally thought to have been *Aphelochaeta multifilis* (Moore, 1909), but upon further examination turned out to be another *Protocirrineris*.

The second day of the meeting focused on cossurids. Member, Leslie Harris passed out a table she had constructed of *Cossura* species and their diagnostic characters. We reviewed this table and made a few corrections and additions. The revised version of this table will be included in next month's newsletter.

In an upcoming volume of the MMS atlas 6 species of *Cossura* will be described. This includes a new species, which appears in the SCAMIT Taxa List as *Cossura* sp. A. All of these species have distinct methyl green staining patterns, which will also be included in the atlas.

It has been the common practice of SCAMIT members to separate different species of *Cossura* mainly by their staining patterns. It was suggested by Leslie Harris (NHMLAC) that there are other characters that need to be examined. They include:

1) The # of digitate lobes on the proboscis.

2) The placement of the branchial filament.

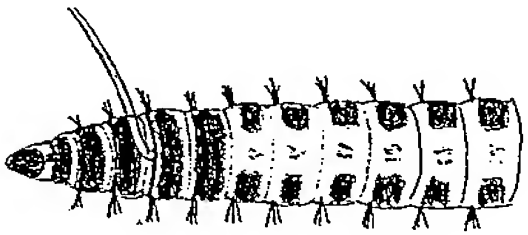
3) The relative thickness of the anterior notosetae in proportion to the anterior neurosetae (Are the neuroseta so thick that they can actually be counted?).

4) Where the areas of transition on the body are located and are these transitions due to a change in the stain pattern, a change in body shape or a change in the setal fascicles.

5) The stain pattern on the lateral edge or area between the noto- and neurosetal fascicles. (Is the pattern continuous?)

At the meeting we were able to compare the stain patterns of *Cossura*s found in the samples from the SCBPP by the various agencies. We found that we all had two different patterns, and with some slight variation these two patterns were seen by all the agencies. Once again, the variation in the staining patterns may have been due to the technique used or the size and maturity of the specimens. Rick Rowe (CSDMWWD) found that he achieved a fairly consistent stain pattern in the cossurids if he let them sit in a saturated solution of methyl green crystals and 70% ethanol for about 20 minutes and then let them de-stain for 2 hours in 70% ethanol. The time of the de-staining seems to be very critical because the stain leaches out so quickly. The specimens should probably be examined every 30 minutes during the 2 hours for a visible patten. If your solution of methyl green is super concentrated the amount of time you let a specimen stain past it's saturation point shouldn't matter. SCAMIT hopes to review more of these staining techniques at the August meeting.

At the meeting we stained type specimens of *Cossura candida* using Rick's technique and found that the stain pattern matched one of our two patterns. These cossurids exhibited a dark stain on the prostomium and the first 3 setigers down to the branchial filament. We decided that we would continue to call our specimens with this pattern *Cossura candida*, especially for the SCBPP. As for specimens with the other pattern, where "shoulders" or squares of stain are present dorsally as illustrated below, we would refer to those as *Cossura* sp. A for now.



Cossura sp. A Methyl Green Staining Pattern

The rest of the meeting on Tuesday was spent reviewing volume 4 of the MMS atlas. Some mistakes in figures were noted along with differences of opinions by SCAMIT members with regard to species names. The mistakes and differences are noted below. All other names have been accepted by members for now. The oligochaetes were not considered in this discussion.

Mystides borealis pg. 139

Figure 4.9 B - The dorsal cirrus is much smaller than the ventral cirrus, unlike its illustration here.

Clavadoce splendida pg. 146

The descriptions of *Clavadoce splendida* Hartman, 1936 and *Clavadoce nigrimaculata* (Moore, 1909) seem similar, but the types are very different. See remark at the top of page 148 and Hartman's key for better differentiation between these two species.

Eulalia bilineata pg. 152

This should be *E. californiensis* (Hartman 1936). *E. bilineata* doesn't occur on our coast. It is a european species. No type material is available of *E. bilineata* only topotypes.

Sige bifoliata pg. 158

Under the material examined section those specimens from Sta. R-8(1) are not *Sige bifoliata* but our common *Sige* sp. A. Also the figure 4.19 of *S. bifoliata* has a much longer median antenna than Moore's original drawing in Hartman's atlas.

Nereiphylla castanea pg. 166

SCAMIT members don't agree with the new synonymy of *Phyllodoce ferruginea* Moore, 1909b. This is due to the fact that our specimens from So. Cal. don't exhibit a flattening of the tentacular cirri like the type-specimen of *N. castanea* from Japan. (See the note from Eibye-Jacobsen on page 167.) While members don't agree with the synonymy it is agreed that the genus should be *Nereiphylla*, not *Phyllodoce*. Until the type material can be reviewed by SCAMIT members we will use this *Nereiphylla castanea*.

Goniada brunnea pg. 223

Figure 7.3 E-F is a posterior view not an anterior view.

Podarkeopsis brevipalpa pg. 261

This species is not known from So. California.

Aglaophamus verrilli pg. 337

Notice synonymy of *Aglaophamus dicirris* Hartman, 1950. *A. dicirris* in our SCAMIT Taxonomic Listing needs to be changed to this.

Nephtys caecoides pg. 344

N. parva Clark and Jones, 1955 should not be under *N. caecoides*. Also, in the description the proboscis has 20 bifid distal papillae, not 22.

Nephtys californiensis pg. 346

Again, description should read proboscis with 20, not 22, bifid distal papillae.

Nephtys cornuta pg. 350

Description should read proboscis with 18, not 14, bifid terminal papillae.

Nephtys ferruginea pg. 351

Description should read proboscis with 20 bifid distal papillae, not 22.

Nephtys signifera pg. 356

This is a junior synonym of *Nephtys ferruginea* Hartman, 1940. The publication synonymizing these two names is in press.

Nephtys simoni pg. 358

The description should read proboscis with

20, not 22, bifid papillae.

UPDATE FOR LOCAL *EUMIDA* SPECIES

Tom Parker (CSDLAC)

The taxonomy of the phyllodocid genus *Eumida* has long been confused. Boundaries between *Eumida* and the related genera *Eulalia*, *Sige*, and *Pterocirrus* have also been unclear. Local taxonomic usage in these genera has been very uneven, with little consensus on the appropriate characters for generic and specific separation. Among those proposed and/or used in the literature are prostomial dimensions, eye size, dorsal cirri placement and shape, tentacular formula, setal length/body width ratio, and pigmentation pattern. Local efforts to standardize identification of *Eumida*-like polychaetes began in the SCCWRP Taxonomic Standardization Program in the 1970's. Susan Hamilton (Pt. Loma Lab) produced a set of voucher sheets for distribution through the Program which characterized *Eumida* sp 1-5.

Subsequently attempts were made to develop differential characters based on length ratio of setae and cirri. While of utility in separating some species pairs, the ratio character was not generally adopted, and requires more development before routine use. The included table lists relative length of setae to distal cirral extension in the hope it may later be proven of diagnostic value.

No SCAMIT voucher sheets have been produced for any of these *Eumida*-like taxa. Discussions during preparation of the SCAMIT Taxonomic Listing clearly indicated inconsistency in identification of local species and in use of Hamilton's provisional taxa. Recent literature has helped clarify some of the problems with *Eumida/Eulalia/Sige/Pterocirrus* and their constituent species. Pleijel (1990) described the transfer of some taxa from *Eumida* to *Sige*. Eibye-Jacobsen (1991) reviewed *Eumida*, producing a history of taxonomy in the genus, a key to species, nomenclatural discussion, and a cladogram. Pleijel (1991) reviewed the family Phyllodocidae and rediagnosed the genera. Pleijel's Scandinavian regional monograph of the family Phyllodocidae (1993) illustrated and described the *Eumida* from that region. Blake and Hilbig (1994) listed and described two species of *Eumida* from southern California, and transferred *Eumida bifoliata* to *Sige*.

In his 1990 paper Pleijel differentiated *Sige* from the other genera; "the prolonged superior parapodial lobes distinguish *Sige* from all other phyllodocids provided with five antennae." In 1991 he pointed out that species of *Sige* have prolonged digitate dorsal setigerous lobes, while species of *Eumida* and *Eulalia* have "symmetrical lobes."

Eibye-Jacobsen (1991) listed numerous characters for *Eumida* and stated "The shape of the dorsal cirri is a most important diagnostic character in *Eumida*." He indicated that setal articulation, while useful in separating *Eumida* from other genera, was rarely useful in separating species within the genus. In his phylogenetic character table he listed states for 21 characters in *Eumida* and *Sige*. The states of only two characters differ consistently between these genera. These are the developed vs. reduced condition of segment 1 dorsum, and the digitate vs. non-prolonged condition of the superior neuropodial lobe.

The attached voucher sheets stabilize local taxa, incorporate recent literature changes, and update the original names applied by Hamilton in 1976. The attached table compares Hamilton's *Eumida sp 2* to several similar species, and shows few clear morphological differences between them. There appear to be only slight differences between *Eumida sp 2*

and *Eumida longicornuta* in the examined characters. Until other differential characters can be found, *Eumida sp 2* should be treated as a synonym of *Eumida longicornuta*.

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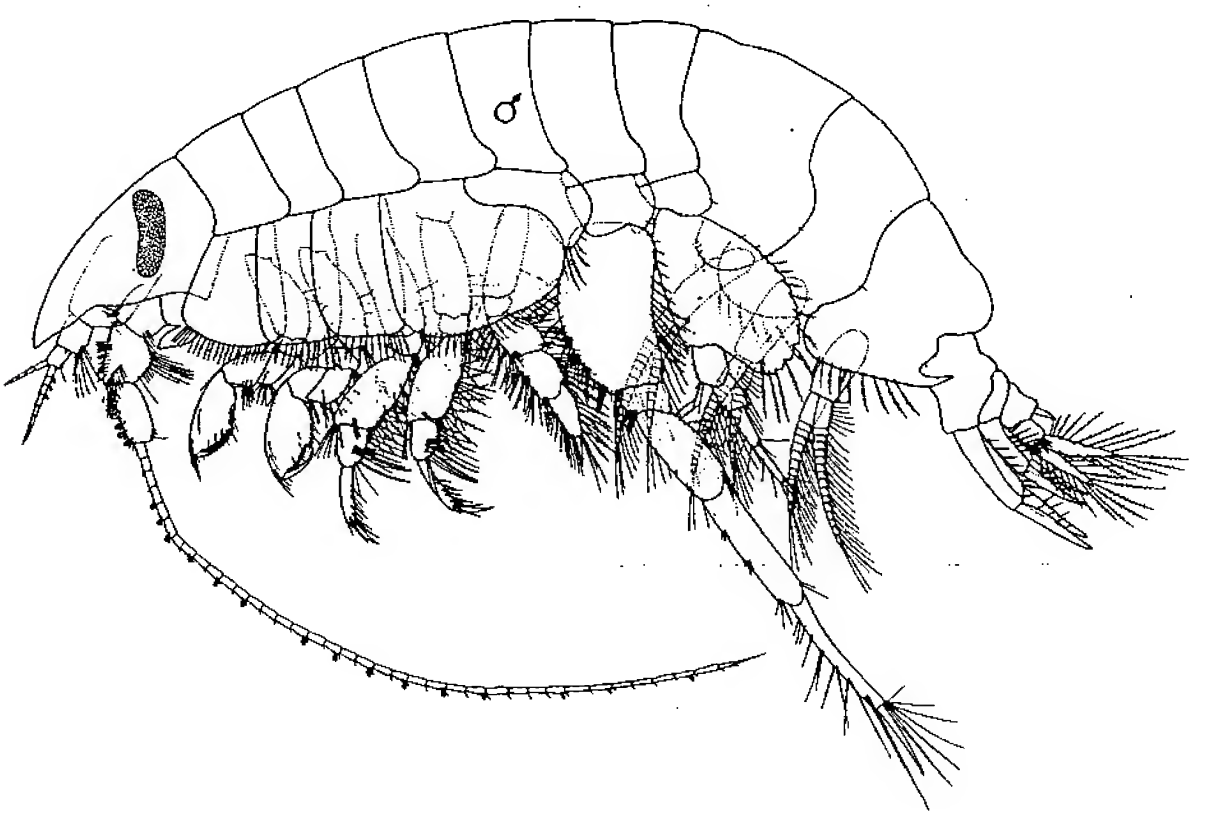

Heterophoxus affinis (from Jarrett & Bousfield 1994)

SCAMIT OFFICERS:
If you need any other information concerning SCAMIT please feel free to contact any of the officers.

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Volumes 1 - 4 (compilation).....$ 30.00
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Single back issues are also available at cost.

Published accounts of polychaete staining

	Onuphidae	**Fabriciniae**
author	Winsnes	Fitzhugh
author's comment	Noted that aberrant patterns may be new species. Suggests combined use with anatomical features. Specimens from diffferent samples react differently; specimen size doesn't impact stain patterns, only it's intensity. Accepts fairly large variation with species, both intensity and pattern. Some differences suggested as fixation response.	Considerable variation between paratype and holotype in 1st three setigers. Maybe due to sexual dimorphism differences.
	Maldanid/Bogueidae	**Sabellidae**
author	Wolf	Banse
author's comment	Didn't report variability. Stated it shows glandular (mucous) cells.	Stable patterns, little variation in stain.
	Terebellidae	**Sphaeroridae**
author	Williams	Blake and Hilbig
author's comment	"fell short of expectations"; "limited use" for Terebellids.	"appears to be species-specific". Includes several other families.
	Trichobranchidae	**Magelonidae**
author	Solis-Weiss/Fauchald	Nateewathana/Hylleberg
author's comment	Variability may be due to poor specimen condition; otherwise consistent, but non-differential.	No variability noted, stain is species specific.
	Euchone	**Sabellidae**
author	Banse	Giangrande
author's comment	Little variation in stain noted; variation in Euchone but still useful.	Stain pattern stable but not diagnostic.
	Cossuridae	**Nephtyidae**
author	Blake and Hilbig	Hilbig
author's comment	"appears to be species-specific". Includes several other families.	Considers diagnostic of some species.
	Capitellidae	
author	Warren, et al	
author's comment	"suspect that fixation and preservation may influence..pattern observed". Comparison should only be made between individuals subject to identical fixation and preservation. Larger species do not show stain bands. "May be considerable individual variation, especially in the number of setigers stained."	

Comparison of Hamilton's provisional species #2 with similar published Eumida

	sp. 2 of Hamilton	longicornuta	bahusiensis	sanguinea	tubiformis
proboscis papillae	smooth,w/distal papillae	smooth,some ridge w/distal papillae	smooth,w/papillae diffusely arranged distally	smooth, w/micropapillae diffusely arranged w/six longitudinal bars	smooth,w/distal papillae & micropapillae
dorsal pigment	horizontal bars w/some on prostomium	dusky or w/horizontal bars w/some on prostomium	horizontal bars &intersegmental on head	weak horizontal bars	brown or w/dark patches
parapodial lobe shape	rounded	rounded	rounded	rounded	superior and inferor lips extended, parapod extended
dorsal cirri shape	length/width subequal	length/width subequal	length/width subequal	longer than width	length/width subequal
setal length relative to dorsal cirri	slightly longer ~= setal length	slightly longer ~= setal length	slightly longer ~= setal length	longer >.5 x setal length	longer >.5 x setal length
setal length relative to ventral cirri	shorter than parapodial lobe	longer or shorter than parapodial lobe	longer than parapodial lobe	longer than parapodial lobe	equal to lobe length
antennae placement	between eyes	slightly anterior to eyes	between eyes	between or anterior to eyes	between eyes
habitat	silt, 75-620M	shallow subtidal	mud-sand,10-135M	all sediments' intertidal-175M	mixed, 200-620M

SCAMIT Code:

Date Examined: May 30, 1995
Voucher by: Tony Phillips
Hyperion

Synonymy: Protocirrineris sp. 2 (Phillips)
Aphelochaeta multifilis

Literature: Day, J.H. 1967
Petersen, M.H. 1991
Wolf, P.S. 1984

Diagnostic characters:

1. pair of grooved palps anterior to setiger one absent;
2. two groups of tentacular cirri (Figure 1) present on setigers 4-6;
3. branchial filaments start setiger 3;
4. acicular spines absent, only capillary setae present (through 150+ setigers);
5. eyes not evident;
6. prostomium short with three achaetous rings, no differentiation in width, body of uniform width continuous through posterior setigers, first 10-12 thoracic setigers not as compressed as posterior setigers;
7. methyl-green stain pattern (Figure 1) present on both dorsal and ventral areas of prostomium, stain also present dorsally through first three setigers, between notopodia and neuropodia through first 20-30 setigers, and ventrally on base of neuropodia, no stain evident remainder of animal, ventrally stripes present through approximately 20 thoracic setigers.
8. distinct non-pigmented arch present on anterior portion of prostomium (Figure 1) just behind tip;
9. pygidium not present.

Depth Range: 59 meters

Distribution: Southern California Bight - Santa Monica Bay

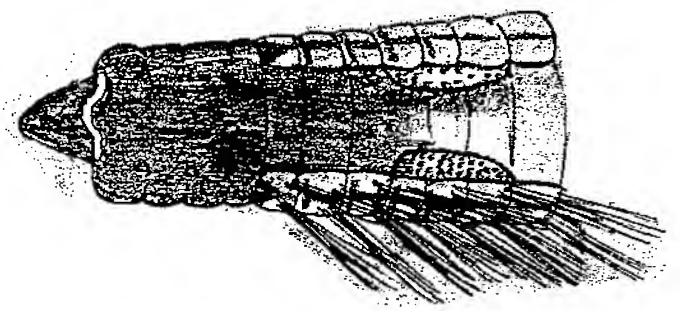


Figure 1

Remarks: This beast was mistakenly identified as Aphelochaeta multifilis. In earlier haste I had noticed that both noto and neurosetae were smooth capillaries, no acicular spines present, aka.....Aphelochaeta. What had been a pair of tentacle scars quickly disappeared when debris was brushed off. Having just finished my voucher sheet for Protocirrineris sp. A, checking this animal to be a member of the same genus quickly opened my eyes to the groups of tentacular cirri on setigers 4-6. Oops. This animal differs from P. sp. A by placement of tentacular cirri groups, methyl-green stain, body shape, and preserved body color. P. sp. A has a brownish body color where P. sp. B is a light-grey.

Two specimens of this beast have been collected, both incomplete, at a single station in central Santa Monica Bay.

SCAMIT Code:

Date Examined: May 11, 1995
Voucher by: Tony Phillips
Hyperion

Synonymy: Tharyx sp. D (Dorsey)(in part)

Literature: Blake, J.A. 1991
Dorsey, J.H. 1985 (unpublished)

Diagnostic characters:

1. pointed prostomium;
2. anterior thoracic are not inflated or laterally expanded, setigers not compressed;
3. pair of grooved palps anterior to setiger one present;
4. abdominal segments not moniliform;
5. only simple capillary setae present;
6. pygidium slightly inflated, distinct ventral groove and slight dorsal groove;
7. methyl-green stain pattern on dorsal prostomium and first few setigers may show speckling in smaller forms (10-15 mm)(Figure 1), larger individuals with dense speckling on posterior of prostomium and anterior setigers (Figure 2), there is a distinct clear area around tentacle scars separating the posterior prostomium and anterior setigers, speckling on anterior setigers begins in center of setiger one and expands laterally with progressive setigers before disappearing around 15th setiger, ventral thoracic setigers (5-20) bands evident (Figure 3), central bands nearly continuous between neuropodia, 2-3 anterior and posterior weaker, single ventral spot present on posterior setigers directly between each setal bundle (Figure 4), a pigment spot also present on posterior of each parapodia, no stain on last 20+ posterior setigers and pygidium, distinct lateral stripes (continuous dorsal and ventral) on 30+ setigers in front of non-stained posterior setigers.

Depth: 150 - 200 meters

Distribution: Southern California Bight - Santa Monica Bay to Newport Beach;

Remarks: This species is very spectacular for its methyl-green stain of the abdominal setigers with stripes. The ventral thoracic stain patch is much stronger than that seen on Aphelochaeta monilaris.

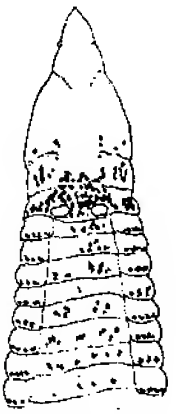


Figure 1

Figure 2

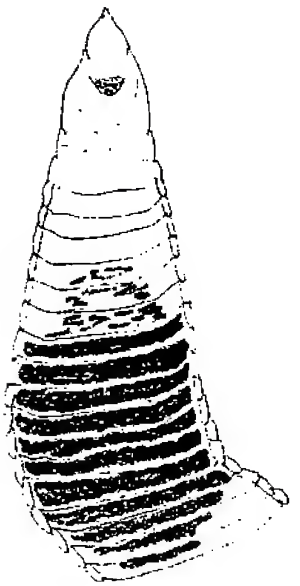


Figure 3

Figure 4

SCAMIT Code:

Date Examined: May 11, 1995
Voucher by: Tony Phillips
Hyperion

Synonymy: Aphelochaeta sp. C (Dorsey)
Tharyx sp. C (Dorsey)
Tharyx nr sp. C (Dorsey)

Literature: Blake, J.A. 1991
Dorsey, J.H. 1985 (unpublished)

Diagnostic characters:

1. pointed prostomium;
3. pair of grooved palps anterior to setiger one present;
4. abdominal segments not moniliform;
5. only simple capillary setae present;
6. pygidium slightly inflated, distinct ventral groove and slight dorsal groove;
7. uniform light greenish-blue hue to whole worm when placed in methyl-green stain
8. ventral thoracic region (approx. setiger 5-15) has natural light brown to gold patch present, retains this color after placed in methyl-green stain.

Depth: 45 - 150 meters

Distribution: Southern California Bight - Santa Monica Bay to San Diego, Puget Sound

Remarks: This species could be confused with Monticellina tessellata if not closely examined. The lack of a dorsal crest anterior to the first setiger and the presence of a ventral brown/gold patch on the anterior thoracic setigers separate Aphelochaeta sp. C (Dorsey). Aphelochaeta sp. C (SCAMIT) is found in large numbers in the transitional zones around the Hyperion outfalls in Santa Monica Bay.

SCAMIT Code:

Date Examined: May 27, 1995
Voucher by: Tony Phillips
Hyperion

Synonymy: Tharyx sp. D (Dorsey)(in part)
Tharyx sp. E (Dorsey)

Literature: Blake, J.A. 1991
Day, J.H. 1967
Dorsey, J.D. 1985 (Unpublished)
Fauvel, P. 1927

Diagnostic characters:

1. pointed prostomium;
2. anterior thoracic region slightly inflated with distinct lateral compression - ventrally giving the appearance of a cobra with its hood inflated;
3. pair of grooved palps anterior to setiger one present;
4. anterior setigers not moniliform;
5. only simple capillary setae present;
6. pygidium inflated, both dorsal and ventral groove present;
7. methyl-green stain forms distinct patch on anterior ventral thoracic region (Figure 1) between setigers 5-20, continuous transverse bars extend between neuropodia and dorsally along anterior face of parapodia, dorsally this stain is evident on anterior of notopodia for approximately 15-20 setigers, prostomium not stained though some speckling may occur just anterior to first setiger (Figure 2), posterior to ventral thoracic stain patch a single spot situated between setal bundles extends for 20-30 setigers along with stain patch on anterior of parapodia (Figure 3), no stain on posterior setigers or pygidium.

Depth Range: 30 - 75 meters

Distribution: Southern California Bight - Santa Monica Bay to San Diego; Puget Sound

Remarks: The methyl-green stain on the ventral thoracic region is more intense than that seen for A. monilaris and A. sp. 1 (Blake). A. marioni can be separated from A. monilaris by the presence of ventral stain spots posterior of the ventral stain patch and if the pygidium is present, the presence of both a dorsal and ventral groove. A. sp. 1 (Blake) can be separated by the lateral stripes on posterior segments and the dorsal stain present posterior to the tentacle scars anterior of the first setiger.

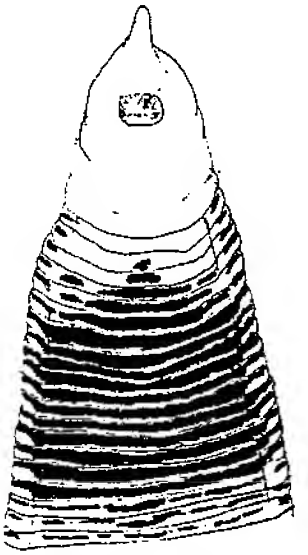


Figure 1

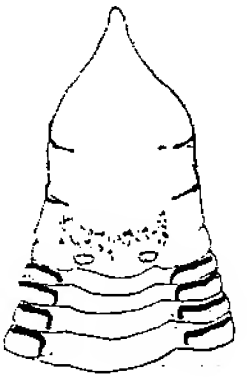


Figure 2

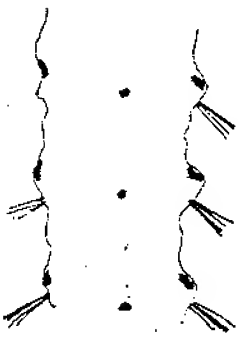


Figure 3

Aphelochaeta monilaris (Hartman 1960)
Cirratulidae

SCAMIT Code:

Date Examined: May 11, 1995
Voucher by: Tony Phillips
Hyperion

Synonymy: Tharyx sp. G (Dorsey)

Literature:
Blake, J.A. 1991
Dorsey, J.H. 1985 (unpublished)
Hartman, O. 1960
Hartman, O. 1969

Diagnostic characters:

1. small form (Figure 1), up to 10 mm, less than 1 mm wide;
2. pair of grooved palps anterior to setiger one present;
3. abdominal segments moniliform;
4. only simple capillary setae present;
5. pygidium inflated;
6. methyl-green stain pattern (Figure 2 and 3) on dorsal prostomium and first few setigers may show some slight speckling, ventral thoracic setigers (5-15) bands evident, central 4-5 bands nearly continuous between neuropodia, those anterior and posterior weaker, no stain present on posterior setigers;

Depth: 60-150 meters

Distribution: Southern California Bight - Santa Monica Bay to San Diego; Puget Sound

Remarks: Specimens collected in Puget Sound are much larger (15 mm) and more robust. They show the same methyl-green stain pattern and the abdominal moniliform segments.

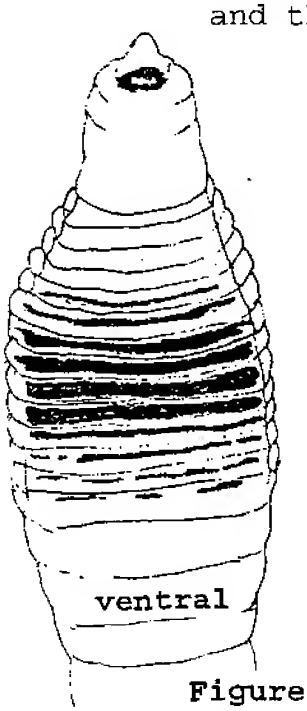


Figure 2

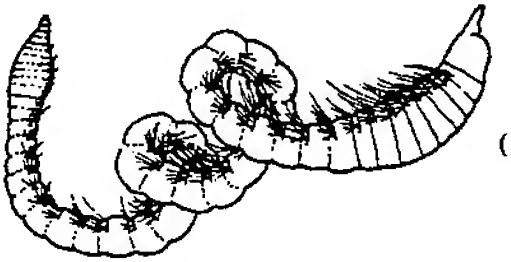
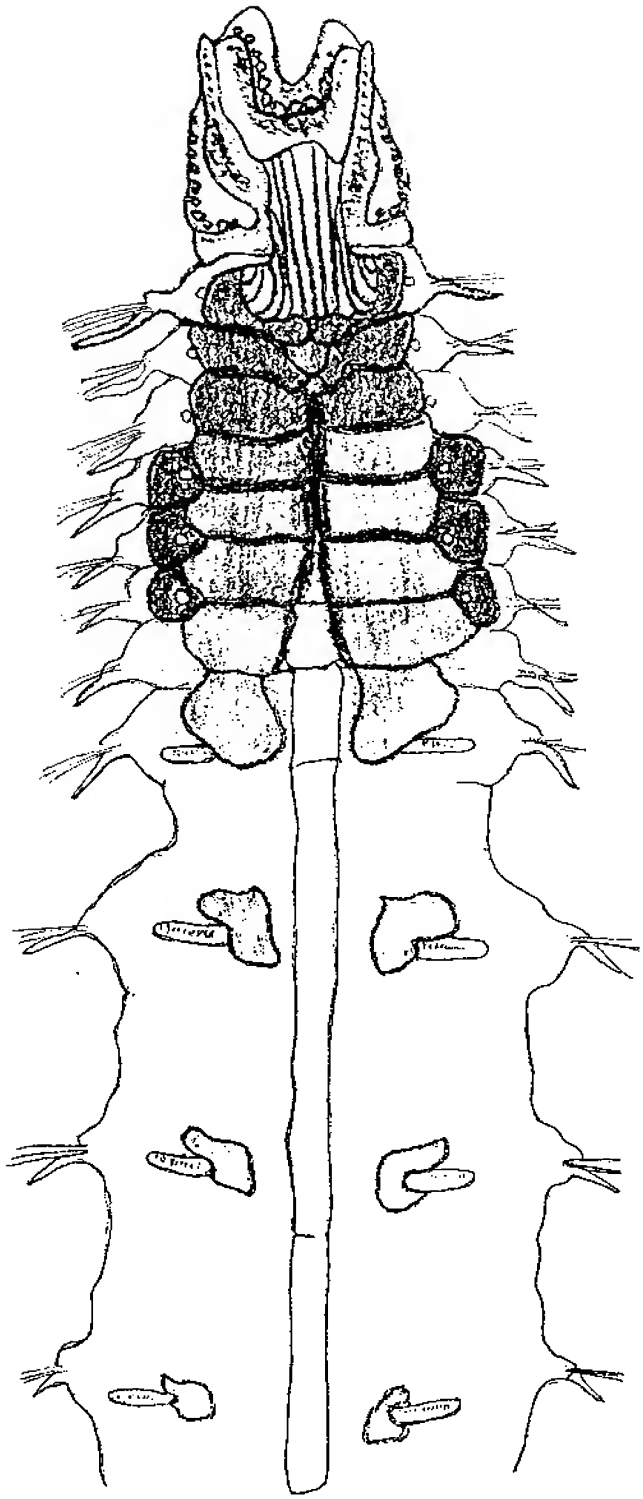


Figure 1
(from Dorsey 1985)

Figure 3
(from Dorsey 1985)



Polycirrus californicus Moore 1909

Eumida longicornuta (Moore 1906)
Phyllodocidae

SCAMIT Vol. 14, No. 1

May 22, 1995
Voucher By: T. Parker

SYNONYMY: *Eumida sp. 2* of Hamilton 1976

LITERATURE: Hamilton's SCCWRP Taxonomic Standardization Handouts(*Eumida sp. 1-5*)
SCAMIT Newsletter, Vol. 6, No. 8, 1987
Pleijel 1990
Pleijel 1991
Eibye-Jacobsen 1991
Pleijel 1993
SCAMIT Taxonomic List 1994
Blake and Hilbig 1994

DIAGNOSTIC CHARACTERS:

1. Less than 10 mm long, commonly 3-5mm entire. Width to 1.4 mm sans parapodia.

2. Prostomium rounded or with small frontal peak at point of terminal antennae insertion. Medial antennae inserted between eyes, extends sometimes to segment 2-3.

3. When everted, pharynx walls smooth. Distal papillae visible when fully everted.

4. Four pairs of tentacular cirri extended to segments 7-9.

5. Neuropodial lobes without prolonged or digitate lobes in either superior or acicular position. Neuropodia may appear with slight lip above and below point of aciculum.

6. Dorsal cirri are clearly cordate. Base is nearly as broad as length, often drawn out to a distal tip.

7. Setae typically not extended(or only slightly)beyond most distal margin of dorsal cirri.

8. Pigmentation on dorsum form clear horizontal bands across each segment. When exposed, intersegmental region shows similar shaped but lighter banding. Prostomium pigmentation densest anterior to and between eyes.

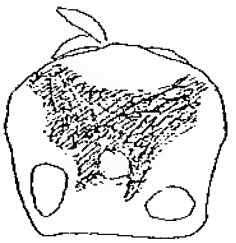
RELATED SPECIES AND CHARACTER DIFFERENCES:

See accompanying table for diagnostic characters and similar species.

DISTRIBUTION: Throughout Southern California in 24-~200M.

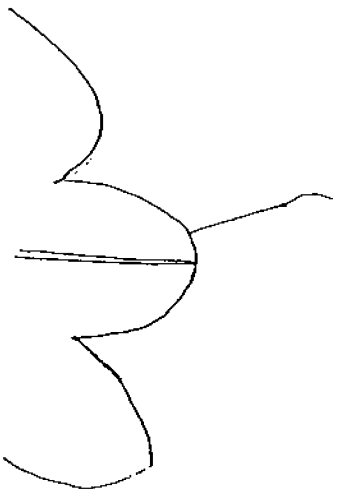
COMMENTS:

No morphological character(s) has been found to separate *E. longicornuta* from *E. sp 2.* The shallower depth range for *E. longicornuta* is not considered here an adequate diagnostic character. Segments 1 &2 do not possess pigmentation entirely across dorsum in contrast to illustration provided by Blake and Hilbig (1994) in MMS atlas

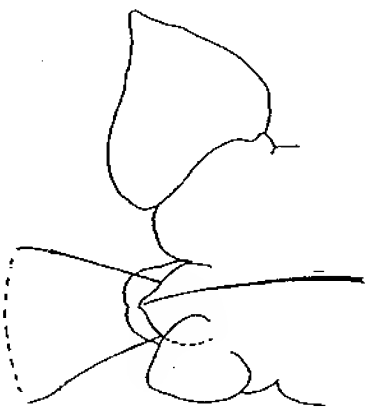


prostomium
LACSD-Y8C

dorsal pigmentation
LACSD-Y8C



parapodial lobes, seg. #28
anterior view
ventral cirri only
LACSD-Y8C



parapodial lobes, seg # 27
posterior view
both cirri
LACSD-Y8C

Sige sp. A SCAMIT 1995
Phyllodocidae

SCAMIT Vol. 14, No. 1

May 22, 1995
Voucher By: T. Parker

SYNONYMY: *Eumida sp. 1* of Hamilton 1976

LITERATURE: Hamilton's SCCWRP Taxonomic Handouts(*Eumida sp. 1-5*)
SCAMIT Newsletter, Vol. 6, No. 8, 1987
Pleijel 1990
Pleijel 1991
Eibye-Jacobsen 1991
Pleijel 1993
SCAMIT Taxonomic List 1994
Blake and Hilbig 1994
Not Fauchald 1977 (as *Eumida bifoliata*)

DIAGNOSTIC CHARACTERS:

1. Less than 8mm long, commonly 3-5mm entire. Width to 0.75mm sans parapodia.

2. Prostomium rounded with 4 terminal antennae, less than length of prostomium. Medial antennae inserted between eyes, extends sometimes beyond segment 1 to segment 3.

3. When everted, pharynx walls smooth or wrinkled without papillae. Ring of papillae on distal end only.

4. Four pairs of tentacular cirriform cirri extended to segments 6-7.

5. Superior neuropodial lobe is prolonged or digitate and is a diagnostic character for the genus.

6. Dorsal cirri variable, but typically longer than broad. May be moderately cordiform or approaching lanceolate condition.

7. Setae typically extend well beyond (>.5 x setal length) most distal margin of dorsal cirri.

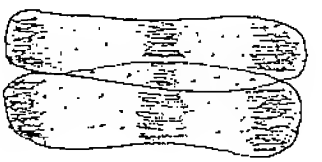
8. Pigment spots on dorsum most dense at lateral margins of body wall and centrally on many segments. This pattern resembles 3 longitudinal lines. Prostomium and segments 1-2 may be diffusely speckled.

RELATED SPECIES AND CHARACTER DIFFERENCES:

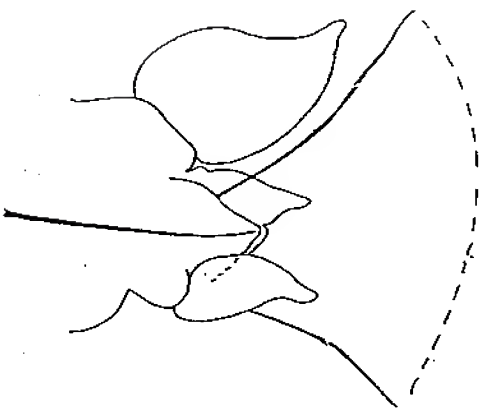
Species of *Eumida* lack the digitate superior neuropodial lobe that is diagnostic for *Sige*.

DISTRIBUTION: Throughout Southern California in 30-305 M.

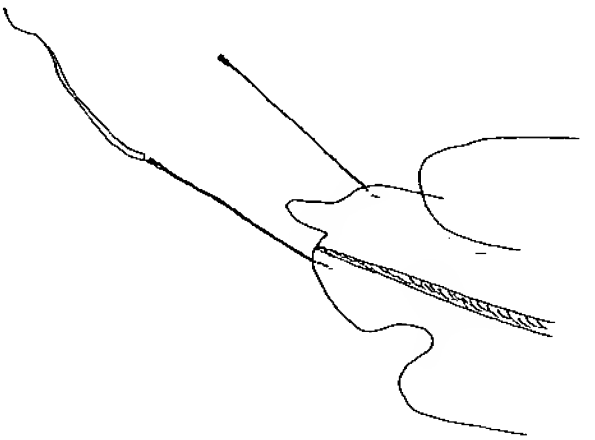
prostomium
LACSD-T50



dorsal pigmentation
LACSD-T50



parapodial lobes w/o cirri
anterior view,seg #13
LACSD-T50



parapodial lobes w/cirri
posterior view,seg. #~18
LACSD-T50

May 22, 1995
Voucher By: T. Parker

SYNONYMY: *Eumida sp. 4* of Hamilton 1976
Eulalia sp. 4 (Hamilton 1976), fide SCAMIT 1994

LITERATURE: Hamilton 1976, SCCWRP Taxonomic Handouts(*Eumida sp. 1-5*)
SCAMIT Newsletter, Vol. 6, No. 8, 1987
Pleijel 1990
Pleijel 1991
Eibye-Jacobsen 1991
Pleijel 1993
SCAMIT Taxonomic List 1994
Blake and Hilbig 1994

DIAGNOSTIC CHARACTERS:

1. Length ~= 15 mm entire. Width 0.75 mm sans parapodia.

2. Prostomium pentagonal with lateral angle inward just anterior to eyes. Distal tip distinctly flattened with 4 terminal antennae > 0.5 x length of prostomium. Medial antennae inserted centrally on prostomium but anterior to eyes, to about segment 2.

3. Everted pharynx walls smooth without wrinkles. Distal end not observed.

4. All three tentacular segments visible dorsally, but segment 1 reduced laterally. 4 pairs of cirriform tentacular cirri with fine tips that extend to segment 5.

5. Superior neuropodial lobe extends out into digitate lobe. Most developed beyond segment 25.

6. Dorsal cirri longer than broad anteriorly, broadens in mid body to heart shaped cirrus with broad base and tapered tip. Become narrower again in far posterior

7. Ventral cirri more narrow and clearly larger than wide. Extends just beyond distal end of superior neuropodial lobe.

8. Setal rostrum ends slightly beyond tip to superior neuropodial lobe. Flagellum of setae slightly beyond distal tip of ventral cirrus

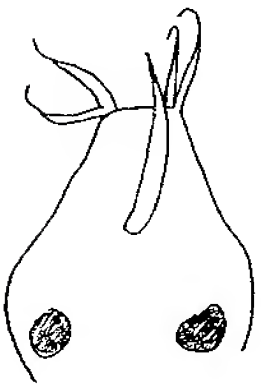
9. Pygidium encircled in pigment with pigment bisecting terminus.

10. Dark brown pigment over all antennae, tentacles, segments, cirri, and lobes.

RELATED SPECIES AND CHARACTER DIFFERENCES:

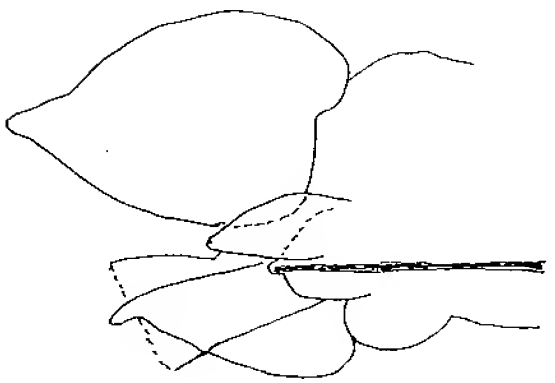
S. fusigera with similar dark pigmentation, but lacks similar dorsal cirri morphology.
S. oliveri with similar pigmentation and parapodial structure, but is eyeless.
S. brunnea and *S. fauchaldi* both eyeless.

DISTRIBUTION: Palos Verdes sandy silt, 150 M

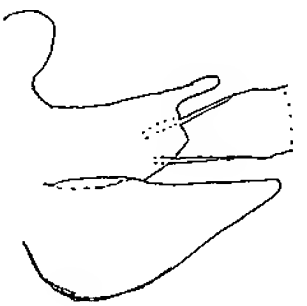


prostomium
LACSD-0186-1B

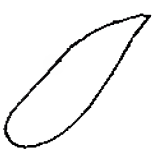
Pygidia
terminal view
LACSD-0186-1B



parapodial lobes
anterior view
LACSD-0186-1B



parapodial lobes, no dorsal cirri
anterior view, seg # 32
LACSD-0186-1B



anterior dorsal cirri
LACSD-0186-1B

Pterocirrus montereyensis (Hartman 1936)
Phyllodocidae

SCAMIT Vol. 14, No. 1

May 22, 1995
Voucher By: T. Parker

SYNONYMY: *Eumida sp. 5* of Hamilton 1976

LITERATURE: Hamilton's SCCWRP Taxonomic Standardization Handouts(*Eumida sp. 1-5*)
SCAMIT Newsletter, Vol. 6, No. 8, 1987
Pleijel 1990
Pleijel 1991
Eibye-Jacobsen 1991
Pleijel 1993
SCAMIT Taxonomic List 1994
Blake and Hilbig 1994

DIAGNOSTIC CHARACTERS:

1. Length 12mm incomplete. Width 1.5mm sans parapodia.

2. Prostomium rounded with 4 thick based terminal antennae, each nearly as long as prostomium. Medial antennae also thick based and extends to at least segment 2. Medial antennae insertion well forward of eyes, nears anterior end of prostomium. Prostomium appears divided into 4 plates or regions, each triangular in shape. Center anterior plate with median antennae. Both lateral plates inflated and with posteriorly placed eyespots. Central posterior plate situated between eyes and finely speckled.

3. Eyes may be large and dense, may occupy lateral pale areas seen in this specimen.

3. 4 pairs of thick tentacular cirri with foliose extension on ventral margin of ventral cirri. Cirri extend to segment 3 or 4.

4. Pharynx missing.

5. Large thin dorsal cirri with broad base, extended margins, and fine tip.

6. Ventral cirri missing.

7. Knobbed aciculum extended from parapodia.

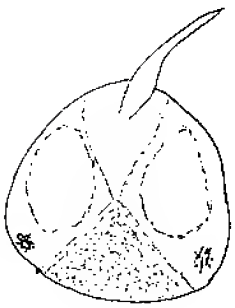
8. Dorsum pigmented heavily across each segment and intersegmental area, fading to pale at lateral margins of dorsum.

RELATED SPECIES AND CHARACTER DIFFERENCES:

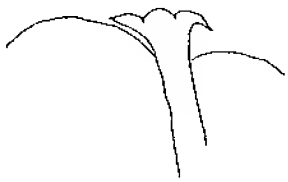
Close to *Pterocirrus macroceros*

DISTRIBUTION: Palos Verdes amidst *Salmacina* in 23M. Also in rocky habitats with algae.

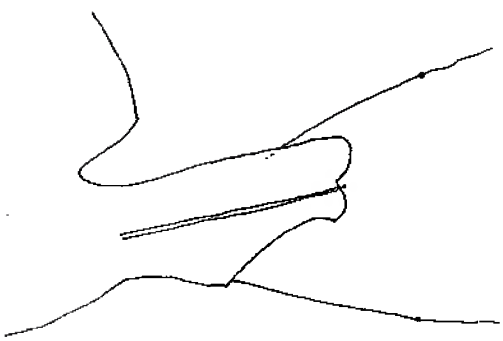
Pterocirrus montereyensis (Hartman 1936)
Phyllodocidae



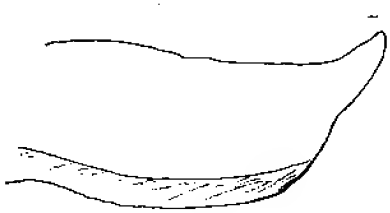
Prostomium
LACSD-T0-75



Parapodial aciculum
LACSD-T0-75



Parapodial lobes
anterior view, seg #45
w/o cirri
LACSD-To-75



Second ventral tentacular cirri
LACSD-T0-75

Pteracirrus sp. A SCAMIT 1995

Phyllodocidae

SCAMIT Vol. 14, No. 1

May 22, 1995

Voucher By: T. Parker

SYNONYMY: *Eumida sp. 3* of Hamilton 1976

LITERATURE: Hamilton's SCCWRP Taxonomic Standardization Handouts(*Eumida sp. 1-3*)
SCAMIT Newsletter, Vol. 6, No. 8, 1987
Pleijel 1990
Pleijel 1991
Eibye-Jacobsen 1991
Pleijel 1993
SCAMIT Taxonomic List 1994
Blake and Hilbig 1994

DIAGNOSTIC CHARACTERS:

1. Length ~= 6mm entire. Width = 0.75mm sans parapodia. Body discretely speckled with pigment, but overall appearance is pale and unpigmented.

2. Prostomium longer than wide, distal end slightly flattened. With four terminal antennae shorter than length of prostomium. Medial antennae equally short and inserted far anterior of eyes, almost to tip of prostomium.

3. Dissected pharynx with densely distributed finger-like papillae with rounded tips.

4. Tentacular cirri to ~ segment 5 dorsally. Dorsal ones cirriform, second ventral cirri broad, flattened, noticeably more massive and expanded than dorsal. These broad cirri with fine upturned tip.

5. Dorsal cirri broken off from this specimen. Ventral cirri small, tear drop shaped ~< 0.5 x length of parapodia.

6. Setal rostrum without small fine teeth, but with strong dorsal tooth at tip of shaft. Flagellum of setae with coarse of heavy tooth pattern.

7. Parapodia extended far beyond (0.3mm) body wall. Broad base of parapodia tapers quickly to dorsally upturned terminal lobe. Under dissecting scope tip appears as continual taper from parapodia. Under compound scope, end of parapodia appears as short digitate lobe.

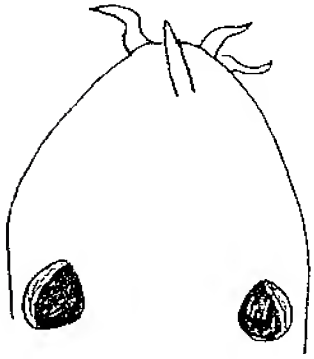
8. Discrete pigment spots on pale dorsum. Segmental lateral spots on both dorsum and ventrum.

RELATED SPECIES AND CHARACTER DIFFERENCES:

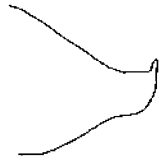
Despite small parapodial digitate lobe apparent under high power, emphasis here is placed on pharynx morphology, foliose ventral tentacular cirri, and anterior medial antennae. This places the specimen in *Pteracirrus*. *P. imajimi* and *P. parvoseta* are both described with short or clavate lobes on the pharynx. *P. californiensis* was originally a *Sige* without any illustrations but with far forward

median antennae and expanded 2nd ventral tentacular cirri. Hartman synonymized it to *S. bifoliata*; Pleijel suggests it belongs in *Pterocirrus* based on Hartman's illustrations. It is unclear what illustrated characters Pleijel was using, but the antennae and tentacular cirri descriptions of Chamberlin's place it in *Pterocirrus*. The *P. californiensis* species level concept is too incomplete to assign a specimen to it.

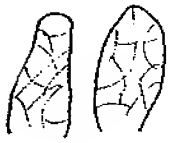
DISTRIBUTION: Pt. Loma in sand at 50 M. Palos Verdes in sandy silt at 60 M.



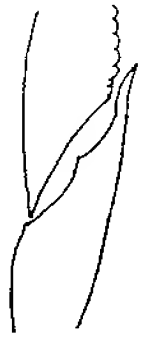
Prostomium
LACSD-VD-1C1



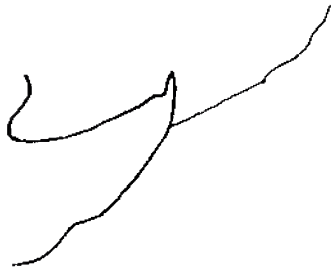
ventral tentacular cirri
LACSD-VD-1C1



Pharynx or proboscis organs
LACSD-VD-1C1



setal rostrum
LACSD-VD-1C1



parapodia, seg #23
dissecting scope view
w/o cirri
LACSD-VD-1C1

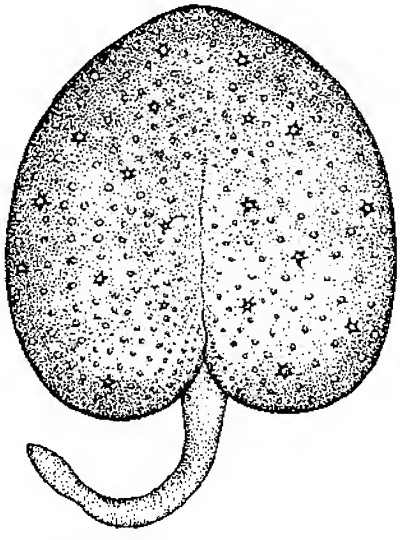
parapodia, seg # 23
compound scope view
w/o cirri
LACSD-VD-1C1

June, 1995 SCAMIT Newsletter Vol. 14, No.2

NEXT MEETING:	SCBPP QA/QC Reanalysis Problems
GUEST SPEAKER:	none
DATE:	July 17 and July 28
TIME:	9:30am - 3:30pm
LOCATION:	See below

JULY 17 & 28 MEETINGS

Both meetings in July will focus on problems arising from the QA\QC reanalysis of the SCBPP samples. The July 17th meeting on non-polychaete species will be held at SCCWRP in Westminster. The polychaete meeting will be on Friday, July 28th, to accommodate those members attending the Polychaete Conference in China. It will be at the worm lab of the Natural History Museum of LA County. Members are reminded that the August meeting will be a discussion of the utilization of staining patterns in polychaete taxonomy. Please give thought to the issue in the interim.



Renilla amethystina (from Williams, 1995)

FUNDS FOR THIS PUBLICATION PROVIDED, IN PART, BY THE
ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.
SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

APOLOGY

As editor of the Newsletter it is my job to oversee not only content, but presentation. This last month we had a failure in that regard, and I must apologize to the membership for the very poor quality of the photocopy of the newsletter. We have taken some steps to assure there is no recurrence, but an apology is still in order. Several of the voucher sheets included with last months newsletter are being redistributed with this newsletter. If any member has other pages that are too difficult to read please contact the secretary for a better copy. - Don Cadien

INDEX

Member Faith Cole (EPA - Newport) has sent us a new index to the first 13 years of the Newsletter. The organization of the list is hierarchical taxonomic by higher categories (phylum, or class), and then alphabetical within category. Subjects indirectly related to taxonomy are listed first with no category code. We all owe Faith our appreciation for the tremendous effort that goes into the preparation of such an index. A copy is attached for your use.

DRAFT REVISION OF ICZN CODE

Included in the most recent American Association for Zoological Nomenclature (AAZN) newsletter (June 1995) is a discussion draft of the fourth edition of the International Code of Zoological Nomenclature (ICZN). SCAMIT members should participate in review and comment on this draft revision to the extent they are able. As users of the ICZN code who are bound by it's provisions, we have a marked self interest in conveying our point of view on the numerous substantive changes proposed for the new fourth edition. Those who have the time and interest for such critical review and comment can receive a copy of the proposed draft by writing to:

American Association for Zoological Nomenclature
C/O A. L. Norrbom
National Museum of Natural History
MRC 168, Washington, D. C.
20560
e-mail mnhen118@sivm.si.edu

Please enclose a check for $3.00 to defray the cost of shipping the draft to you.

SCAMIT members should consider joining the AAZN (annual dues $20.00) to support the activities of both the AAZN and the ICZN. A membership form and explanatory letter are attached.

SETTLEMENT OF "FAIR USE" COPYRIGHT CASE

We have several times previously (SCAMIT Newsletter Vol. 13#9, #11) had comments on this case. It has now been settled and to some extent the legal interpretation of fair use has now been more explicitly established. Although the case was designed to address corporate "fair use" in particular, the court decided that fair use applies to pure academic or research uses, and does not apply to uses resulting in commercial gain. In the later case the copy maker should either seek a license from the Copyright Clearance Center, or pay the usual fee for the right to copy the article. Interested parties should review the article by Lawler (1995) for added detail.

SCBPP COMPOSITE SPECIES LIST

Now that most of the samples from the SCBPP benthic program have been fully analyzed, it is time to begin examination of the data to look for differences in the treatment of species level taxonomy which have so far

escaped detection. A first step in this direction is preparation and distribution of an encountered species list for the SCBPP benthos. Lists are in hand for Orange County Sanitation (MEC), CLAEMD, and CSDLAC, with the list from CSDMWWD of necessity incomplete (they are still processing). There will be some further adjustment of the lists as taxonomic conflicts which surface during the QC sample exchange and reidentification are resolved. A compound list is in preparation at CSDLAC, and will be distributed to the participating agencies once completed.

SCAMIT CONTRIBUTIONS

Attached to the newsletter is a list of publications by members which have been financially supported by SCAMIT. We congratulate all of them on their contributions to marine invertebrate taxonomy. All members should be aware that grants from SCAMIT are available to assist with some of the costs associated with publishing, such as reprints, page charges, and illustrations. Members needing such assistance may request an application from the SCAMIT secretary.

NEW LITERATURE

A second revision of the molluscan family Corambidae was published in 1994. The first and more comprehensive of the two was by Martynov (1994). The local taxonomic impact of that revision was indicated in the December 1994 SCAMIT Newsletter. Now Swennen and Dekker (1994) have put forward another revision of the group based on reexamination and reinterpretation of the taxon *Corambe batava*. They do not appear aware of the Martynov revision, and their paper was probably already in press when he published in Zoologicheskii Zhurnal.

"NAMEIT"

The Northern Association of Marine Invertebrate Taxonomists, whose acronym is "NAMeIT", has produced their first newsletter and a mailing list of their membership. We at SCAMIT would like to congratulate them and wish them lots of luck. It will be nice for SCAMIT to have a sister organization and another group with which to discuss various issues in the field of taxonomy. SCAMIT has had many members that live and work in the Pacific Northwest and British Columbia for many years and this northern organization will hopefully give them a chance to actively participate at local meetings. The organization seems to be off to a great start with two successful workshops, a polychaete and a sponge and echinoderm, already this year. They also have a crustacean and a mollusc workshop planned for later this year. They are planning a quarterly newsletter for now. If you would like more information or would like to contribute to their newsletter please contact:

Roberto Llanso
State of Washington
Department of Ecology
300 Desmond Drive
P.O. Box 47710
Olympia, Washington 98504-7710
e-mail address: RLLA461@ECY.WA.GOV

MINUTES FROM JUNE 12 MEETING

Once again we examined and attempted to resolve problems with selected local amphipod species. Problems with identification of local species are few, but the simple ones have already been resolved, leaving the more complex and intractable ones to be dealt with. Following up our earlier examination of the genus *Photis*, Carol Paquette has provided voucher sheets (attached) for *Photis sp A* and

Photis sp B, which now become of SCAMIT 1995, with no change in letter designation.

Rhachotropis

Publication of a new treatment of the eusirid genus *Rhachotropis* (Bousfield & Hendrycks 1995) prompted a reexamination of specimens from the Southern California Bight, and reconsideration of the SCAMIT provisional species *R. sp A*. Ron Velarde (CSDMWWD) took the lead on this. Ron's examination of Barnard specimens of *R. inflata* showed the *R. inflata* record of Barnard 1971 to be *R. sp. A*. We need to add *R. barnardi* (the replacement name of Bousfield & Hendrycks for the species identified as eyed *R. clemens* by Barnard 1971) to the SCAMIT species list. We examined a fine specimen taken off Orange County during the meeting. In the process we found an error in the new Bousfield & Hendrycks key. In couplet 3 *R. barnardi* is credited with having a tooth on the third pleonal somite, but both the description and figures of the species contradict this.

Ron pointed out differences in the usage of the name *R. oculata* by Bousfield recently, and in his 1973 book on western Atlantic amphipods. There are a number of differences in fine detail, but three stand out: 1.) presence of a short acute lateral head lobe in B & H 1995, and a truncate, virtually non-existent lateral head lobe in B 1973; 2.) a more slender and elongate article 3 of antenna 2 in B & H 1995 than in B 1973; and 3.) presence of long basal and short mid-length plumose telson setae in B & H 1995 and not in B 1973, combined with presence of two rows of short setae at mid-telson in B 1973 and not in B & H 1995. Both descriptions were of mature females, so it may also be significant that the Atlantic specimens were much larger than those from the northeast Pacific.

Ampelisca nr. brevisimulata

For several years Carol Paquette (MBC) has been encountering specimens differing slightly from *A. brevisimulata*. The only consistent difference between this form and the nominate is lack of a tooth on the posteroventral corner of epimeron 2. This feature is illustrated for *A. brevisimulata* by Dickinson (1982), but was neither illustrated nor mentioned by Barnard in his original description (1954). The type should be reexamined, but we could not do so during the meeting (type is at LACMNH). The form lacking the epimeron 2 tooth comprises only a small proportion of the population: up to 10% off O.C., but closer to 1% elsewhere based on material Carol has examined. She will provide a voucher sheet for this provisional taxon next month.

Ampelisca careyi/unsocalae

At previous meetings dealing with amphipods we have wrestled with the separation of *A. careyi* and *A. unsocalae*. It was apparent that different criteria for this separation were in use in the Bight, with the result that specimens clearly identifiable as *A. careyi* by one group were just as clearly identifiable as *A. unsocalae* to another. During the meeting we examined specimens identified as *A. unsocalae* from 305 m. off Palos Verdes, the holotype of *A. unsocalae*, *A. careyi* from Puget Sound, and a CLAEMD specimen from Santa Monica Bay identified as *A. unsocalae*.

In his original description of *A. careyi* Dickinson lists the following characters which serve to separate it from *A. unsocalae*: head shape ("produced anteriorly into a dome-shaped process above antenna 1, lower front margin distinctly concave" vs. "upper front margin not produced forward, lower front margin oblique and convex"); length of tooth on pleon epimeron 3 ("posterior margin convex ending in short acute tooth" vs. "posterior edge convex ending in a long

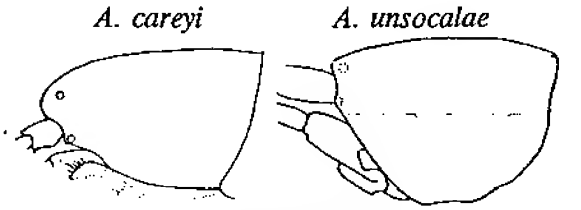
slender tooth"); length of antenna 1 ("extending just beyond end of peduncle of antenna 2" vs. "short, not reaching end of peduncle of antenna 2"); and position of the apical notch in the telson ("laterally notched apices" vs. "centrally notched apices").

It was suggested at the meeting that the antennal length character was at least potentially unreliable. The difference is between slightly less than and slightly more than the length of the antenna 2 peduncle. Loss of only one or two of the terminal flagellar articles is sufficient to change an animal from more than to less than. Since loss of and regeneration (in the next molt) of flagellar articles is very likely to occur, the importance of this character is doubtful. The other characters suggested by Dickinson should be more stable.

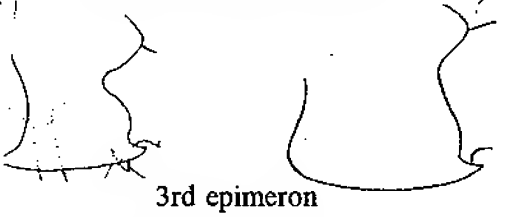
Prior to the meeting the differences in head shape had been interpreted as applying only to the ventral side of the head by some workers. During the direct comparisons the difference in dorsal head shape between the two species became apparent to all participants, and should help standardize identifications in the future. The *A. unsocalae* holotype proved a good match for the figures in Barnard 1960b, with the shape of the underside of the head straight, not convex as shown by Dickinson (1982).

We directly compared the holotype with an "unsocalae" specimen from Santa Monica Bay, one selected as intermediate, and not clearly either *A. unsocalae* or *A. careyi*. It proved to have the characteristic head shape of *A. careyi*, and to differ from the *A. unsocalae* type. The nature of the spination on the lateral face of the outer ramus of uropod 1 was also examined. According to Dickinson, both *A. careyi* and *A. unsocalae* have "basal spines only". This statement is in disagreement with the key of Coyle and Highsmith 1989 (which indicates *A. unsocalae* has spines beyond the midpoint of the ramus). We examined rami of *A. unsocalae* from 305m off Palos Verdes, and of *A. careyi* from southern Puget Sound with a compound microscope. Both these animals had similar spination patterns: spines well beyond 50% of the ramus length; six spines; and the interval between spines lengthening with distance from the base of the ramus. In *A. careyi* the spines did not extend as far distally as they did in *A. unsocalae*.

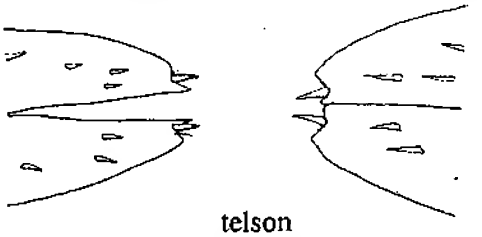
Although Jim Roney (CLAEMD) had not had any problem in application of this character as used in the Coyle & Highsmith key, he will now reexamine the relationship between U1 ramal spination and characters of the head, 3rd epimeron, and telson more closely. For the moment we suggest that use of the U1 spination character to discriminate between *A. careyi* and *A. unsocalae* be discontinued. Illustration of the contrasting character states for these two species is provided below.



head shape
(from Dickinson 1982 & Barnard 1960)



3rd epimeron
(from Dickinson 1982 & Barnard 1960)



telson
(from Dickinson 1982)

Heterophoxus spp

The recent revision of the northeastern Pacific *Heterophoxus* (Jarrett & Bousfield 1994) introduced several new taxa as well as separating as valid taxa several usually consigned to synonymy. This has considerably complicated identification of the genus in our area. Previously we thought we had only a single variable species (*H. oculatus*), but now we are faced with separation of up to four taxa (*H. affinis*, *H. conlanae*, *H. ellisi*, and *H. oculatus*). Three more are reported from either deep water in the Bight, or from adjacent waters.

In their introductory taxonomic commentary Jarrett & Bousfield posit three possible explanations for the morphological diversity observed in *Heterophoxus*. The first is the one which Barnard (1960a) had adopted and continued subsequently; wide variability and broad geographic range for Holmes' species. Their second suggests presence of additional taxa is masked by inadequacies of the descriptions given by Holmes and Barnard. Their third is that Holmes' species are southern forms not reaching into the northeast Pacific, and that northern forms differ at the species level from those in the Bight and off Mexico. They favor the latter explanation based on northern material, but did not reexamine either Holmes' type material or other material described and illustrated by Barnard from southern collections.

Examination of Southern California Bight *Heterophoxus* material, with an eye to the key in Jarrett & Bousfield, yields equivocal results. All the members at the meeting had found variance in leg and epimeron setal counts from those reported by Jarrett & Bousfield for *H. conlanae* and *H. oculatus*. Dean Pasko (CSDMWWD) documented setal counts of article six of periopod six and the ventral margin of the 3rd epimeron for 23 specimens taken at two SCBPP stations, finding little correspondence to counts reported from northern material. There was frequently lack of agreement between left and right legs of a single animal, although they often differed little. We agreed the most distal group on article 6 of periopod 6, whose setae extend out over the base of the dactyl, should not be considered in identifying animals. This group has additional setae, even in the smallest specimens, which do not fit the pattern (single, double, or triple) of group setation elsewhere on the article.

Jim Roney indicated that his experience in Puget Sound was that *H. conlanae* always had two or more setae per group on the posterior margin of article 6 of periopod 6, as illustrated by Jarrett & Bousfield (1994, fig.31) Examination of specimens in hand from Tacoma in the southern Sound showed that the most proximal setal group had but a single seta in most specimens, while more distal groups did have two. Both these Puget Sound specimens and those examined by Dean Pasko from off San Diego show a tendency for smaller animals to have fewer setae per group, and for very small animals to have fewer groups.

Number of setae per group appears to change with growth, with *H. conlanae* (and probably also *H. oculatus*) having more setae in a given group position in larger than in smaller animals. This addition appears to progress proximad, with the additional seta appearing first in the subdistal group, and subsequently in groups closer to the base of the article. Although this was the general pattern, it was not invariate. In the San Diego material (assumed to be *H. oculatus*) the most distal groups sometimes had only a single seta, while intermediate groups had doubly inserted setae.

Jim Roney's northern experience indicated to him that triply inserted setae were always found in *H. conlanae*. This, however, is at variance with the original description

("segment 6 with 3-5 clusters of doubly or triply grouped setae"). The specimens we examined from Tacoma in southern Puget Sound followed this pattern, with some specimens lacking and others having triply inserted setae in the most distal groups on article 6 of periopod 6. Even *Heterophoxus* specimens from San Diego occasionally had one setal group containing triply inserted setae in Dean Pasko's counts. Although strict application of the Jarrett & Bousfield key would place these in *H. conlanae*, the setal count on the ventral margin of the third epimeron in these specimens differed from that of *H. conlanae*.

The key indicates an epimeral setal count of 10 for *H. conlanae*, and 20 for *H. oculatus*. In the description of *H. conlanae* the count is given as 7-10. Holmes (1908) gives the count for the 8mm ♀ holotype of *H. oculatus* as "about 22". He had no other specimens, so the nature of his statement indicates that there was probably a slight difference between the left and right epimeral counts on his animal.

Although most participants had found intermediate epimeral setal counts, the only documented counts were those of Dean Pasko. In his smallest specimen, an unsexed 3mm juvenile, the count was only 4 setae. In four female and one male 5mm long animals Dean found counts of 8, 9, 12, 15, and 9 setae. All these animals had only doubly inserted setae on article 6 of periopod 6. Females of 5.5mm had setal counts of 9, 9, 11, and 12. Of these the last had a triply inserted group on one of it's sixth periopods. Counts on eight female and one male 6mm long animals were even more variable; 11, 11, 11, 12, 12, 13, 13, 14, 9. Two of the females (11, and 14 count) had a triply inserted group on both sixth periopods. Females 6.5 and 7mm in length had epimeral setal counts of 10, 14, and 12 respectively. The 6.5mm long specimen with 14 epimeral setae had a triply inserted group on one of it's sixth periopods.

About 2/3 of the specimens thus have epimeral counts which are too high for the stated range of *H. conlanae*, while none reach the number attributed to *H. oculatus*. We should remember, however, that Holmes' type of *H. oculatus* was a particularly large individual, probably of a later molt than those examined by Dean. Once again, as with the setal groups lining the posterior margin of article 6 of periopod 6, growth tends to bring additional setae. Setal counts did not appear to differ between the sexes, but only two males were examined.

The large percentage of intermediate counts in epimeral setae, and the lack of symmetry in doubly/triply inserted posterior marginal setae on the sixth legs of a single animal point to the possibility that *H. conlanae* is not adequately differentiated from *H. oculatus*. One other character used to differentiate the two in the key is dubious; the relative lengths of the fifth and sixth articles of periopod six. The key lists *H. conlanae* as having article five and six subequal and *H. oculatus* as having article six "distinctly longer" than article five, presumably on the basis of the illustration in Holmes 1908 (also in Jarrett & Bousfield 1994, fig. 29B). Since no mention is made in the text of relative article lengths of five and six, this illustration may be inaccurate. The text states that the dactyl is about 1/2 the length of article six, while the illustration shows it closer to 1/3 the length, suggesting attenuated rendering.

Every specimen examined at CSDLAC which should fit in *H. oculatus* has appeared to have article six longer than article five, but when measured with an optical micrometer the two are almost exactly the same length. I suspect that the longer appearance of article six is an optical illusion resulting from it's being more slender and tapering than article five. This character should probably not be used until the actual condition of the type of *H. oculatus* can be verified.

One additional character (not discussed during the meeting) may help separate these two forms in our area. Jarrett & Bousfield clearly indicate that *H. conlanae* lacks setae on the dorsal side of the pleonal segments, using this character as an additional difference between *H. conlanae* and *H. ellisi* (which is dorsally "fuzzy"-see Jarrett & Bousfield 1994 fig. 32). Local specimens of *Heterophoxus* with doubly inserted (and the occasional triply inserted) setae on the posterior margin of article six of periopod six are dorsally fuzzy. As the presence or absence of dorsal setosity has proven to be a reliable character in some other phoxocephalids (in *Foxiphalus golfensis* for instance), it should be useful here as well.

Until the type of *H. oculatus* is reexamined it is suggested that specimens from the southern California Bight with doubly inserted setae on the hind margin of article 6 of periopod 6 be reported as *H. oculatus* if their pleon is dorsally setose, and as *H. conlanae* if dorsal pleonal setae are absent. *Heterophoxus affinis* is easily separated from it's congeners by absence of posterior marginal setae on article six of periopod six, while *H. ellisi* is recognized by it's dorsal pleon setosity, and absence of either doubly or triply inserted setae on the article six posterior margin.

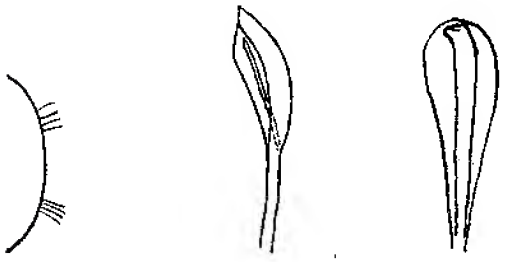
MINUTES FROM JUNE 19 MEETING

The meeting opened with member Leslie Harris (NHM-LAC) giving those present an update on her work with *Cossura*. She has had some difficulty finding reliable diagnostic characters (other than methyl green stain patterns) to use to distinguish between the species of *Cossura*. She is still working on a table comparing the species. She is also planning on putting together a sheet of methyl green staining patterns for *Cossura*. It was proposed that this might be a color xerox sheet that would be available to those members that work with polychaetes for a small fee, depending on the cost. This was proposed because black and white xeroxes of colored drawings do not turn out well. We hope to have both the table and staining pattern sheet available by the next newsletter.

We examined at the meeting a single, small, thread-like capitellid from the SCBPP samples that was identified by CSDLAC as *Heteromastus* sp. LA1. It was from SCBPP station 1256 at 23 meters. This specimen had capillary setae through the 5th setiger, setae in both the first noto- and neuropodia, and hooks with inflated hoods over most of their length.

Re-examination of this specimen during the SCAMIT meeting led to the conclusion that it was a *Mediomastus acutus*. This was based on it's thread-like body, long pointed prostomium, and the inflated hooks which are good matches for the paddle-like notosetae described for *M. acutus* (Warren *et al*, 1994). One comment noted that notopodial fascicles merge near setiger 8.

The paddle-like notosetae and merged notopodia are recent diagnostic characters and the specimen was therefore re-examined by CSDLAC. It should be noted these paddle-like notosetae are only visible under SEM according to Warren *et al*. From this last examination the following conditions were observed: The original count of capillary setigers in first 5 setigers was in error, and the specimen fits well into *Mediomastus*. The notopodia in setigers 8-10 do not appear merged (see illus. #1) . The setal hoods are inflated and extend along much of the setal shaft. They completely encase the setal shaft and do not resemble the shape illustrated by Warren *et al* in figures 3, 4, & 5. The shaft of this specimen's setae extend completely to the distal end of the hood and there appears to be some dentition at the end of this shaft. Below are illustrations of notosetae from (2): *Mediomastus acutus*- Warren *et al* 1994; (3): SCBPP specimen, station 1256.



(1) (2) (3)

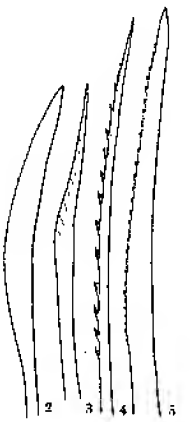
Clearly the setal hoods are not similar. Warren *et al* note the unique paddle-like hood's shape is only seen after preparation for SEM and they possess an "acicular type setae". It may be these setal shapes are actually the result of damage or collapse during preparation and therefore only seen during SEM. From their photographs of the setae, it does not appear to be so small or delicate a feature that only an SEM could resolve it. Such dramatically compressed setal hoods should be visible with a normal compound microscope examination. Hartman's illustration of *M. acutus* (1969, p.389 fig. 3) more closely resembles this specimen's setal condition. It may be prudent to rely upon other characters for this species until it can be demonstrated that this new setal hood structure is not an artifact of handling.

The degree of notopodial fusion illustrated above (fig. 1) and that found in figure 4f of Warren *et al* is considerably different. It may be this character is somewhat unstable for the taxa or also the result of changes during SEM preparation.

Another odd SCBPP capitellid examined at the meeting was CSDLAC's Capitellidae LA1. The specimen was complete with one asetigerous segment present. It had 12 thoracic segments with capillary setae in the noto and neuropodia. The 13th setiger had only capillary setae in the notopodia. It also had notopodial lobes and nephridiopores developed in the first few abdominal segments. The uncini had small hoods in long fascicle. The most unusual characteristic of this specimen was the presence of small, digitate, branchia-like structures posteriorly at about the last 10 or so segments. It was thought that these were probably not branchia since they were not near the parapodia, but occurred mid-segment. However, no one had any idea just what these structures might be instead. This animal had been examined before at a previous SCAMIT meeting and it was thought that it might be a *Notomastus tenuis* with just an aberrant 13th setiger or it could also be *Notomastus magnus* if we accept those structures as being branchia. It was proposed by Leslie Harris that this might be something in the genus *Leiochrus* Ehlers 1908. *Leiochrus* is described as having a thorax with 12-14 segments with 1 asetigerous segment present, the first setiger complete. Up to segment 13 it has capillary setae only with the 14th segment having mixed setae and hooks in both rami. It also has no branchiae. For now CSDLAC has decided to leave it as Capitellidae LA1 pending further examination of the branchia-like structures.

Another odd SCBPP specimen found by CSDLAC was a scaleworm originally thought to be a *Eunoe* from station 1169 at 135m depth. It's diagnostic characters included two types of neurosetae and broad notosetae that were slightly serrated. It also had very long drawn out parapodia and very long dorsal cirri that extended well beyond the tips of the setae, which were also quite long. It was missing all of its elytra except for the first pair, which were very similar to those illustrated for *Eunoe uniseriata* in Banse and Hobson 1968. The elytra are distinct, with a row of cone shaped macrotubercles near the outer margin. Leslie Harris examined this specimen and felt the setae more closely matched those of *Antinoe*, with its two types of neurosetae, one of which was long and heavily pectinate, and its broad notosetae. (See illustrations below.)

We examined these setae at the meeting and agreed that they did look more like those of *Antinoe*. Also the prostomial peaks of this specimen while bluntly rounded were not as squared as those described for *Eunoe uniseriata*. Because this specimen was not whole and had only one pair of anterior elytra it must be left at the generic level.



Antinoe microps (from Hartman 1948)
2,5 - notosetae 3,4 - neurosetae

We also examined a few SCBPP problem specimens from San Diego. The first was a polydorid from station 753 at 137m depth. It was labelled as *Polydora* SD10 and seems to most closely fit the description for *Polydora armata* except for the setae of the modified 5th setiger. After several pairs of eyes examined the setae a flange, even a worn one, could not be found. The other main difference was that the posterior notosetae were in a pinwheel shape not a cone shaped bundle. None of the members present at the meeting had seen this before and were not sure if this may have just been the cone shaped bundle of spines expanded or something entirely different. The pygidium also had 4 lobes instead of a collar with 2 notches. It was decided that this should not be identified as *P. armata*, mainly because of the lack of a flange on the setae of the modified 5th setiger.

Another SCBPP specimen from the San Diego lab that we examined at the meeting was a magelonid. There were two specimens from off of Santa Barbara at depths of 56 and 49 meters. It had frontal horns and normal setae on the ninth. It also had trifid hooks. This animal would key out to *Magelona berkeleyi* except for the lobes on the ninth setiger. The superior lobe was well developed, long and digitate. There was also a small and triangular lobe or median lobe below the superior one. Also the methyl green stain pattern was not that of *M. berkeleyi*, which has a light even green stain on the ventrum and dark green staining spots around the mouth and from the posterior half of segment 4 on back. The first 4 setigers of these specimens stained dark. It was decided that this should probably not be called *Magelona berkeleyi*.

In the afternoon Larry Lovell gave members a preview of his presentation for the polychaete conference. His presentation is on problems associated with species of *Nephtys*. These problems have been detailed in the SCAMIT newsletter vol. 13(5). The biggest problem seems to be the counts associated with the subdistal papillae on the proboscis. Larry has looked at type specimens and determined that the actual number of papillae have been misinterpreted by previous authors. Included in this newsletter is a table comparing a few taxonomic characters between the four common species of *Nephtys* from California. Larry is also working on a paper synonymizing *Nephtys signifera* with *Nephtys ferruginea* and *Nephtys parva* with *Nephtys caecoides*. We wish Larry much success with his presentation at the conference.

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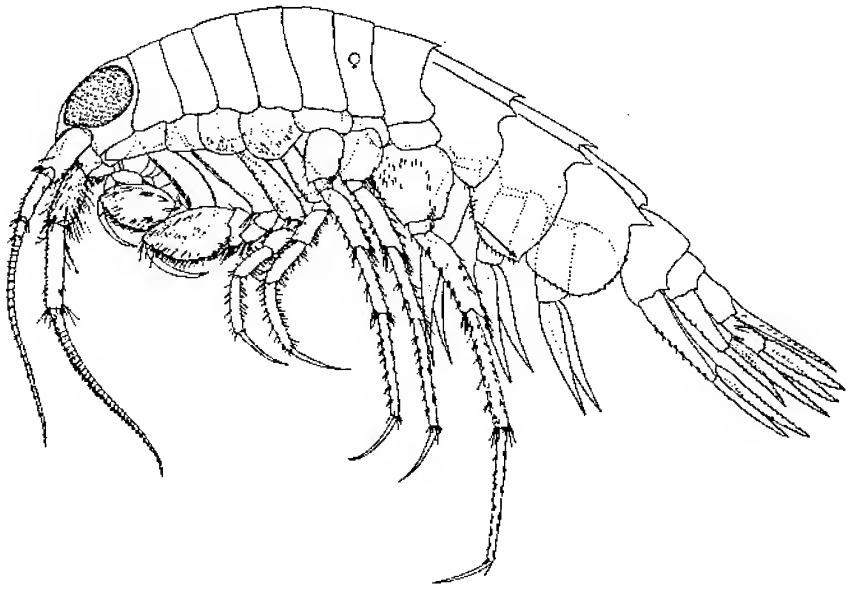

Rhachotropis oculata (from Bousfield, 1973)

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Volumes 1 - 4 (compilation)..... $ 30.00
Volumes 5 - 7 (compilation)..... $ 15.00
Volumes 8 - 13 .....$ 20.00/vol.

Single back issues are also available at cost.

SCAMIT CODE: none

Date examined: 13 March 1995
Voucher by: Carol Paquette

SYNONYMY: *Photis* sp A MBC 1972

LITERATURE: Conlan, K. E. 1983. The Amphipod Superfamily Corophioidea in the Northeastern Pacific Region, 3. Family Isaeidae: Systematics and Distributional Ecology, Nat. Mus. Canada, Publ. Nat. Sci., No. 4.

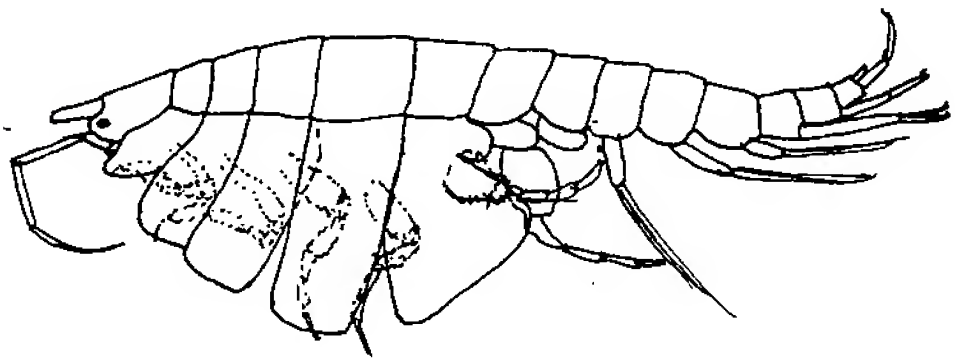
DIAGNOSTIC CHARACTERS:

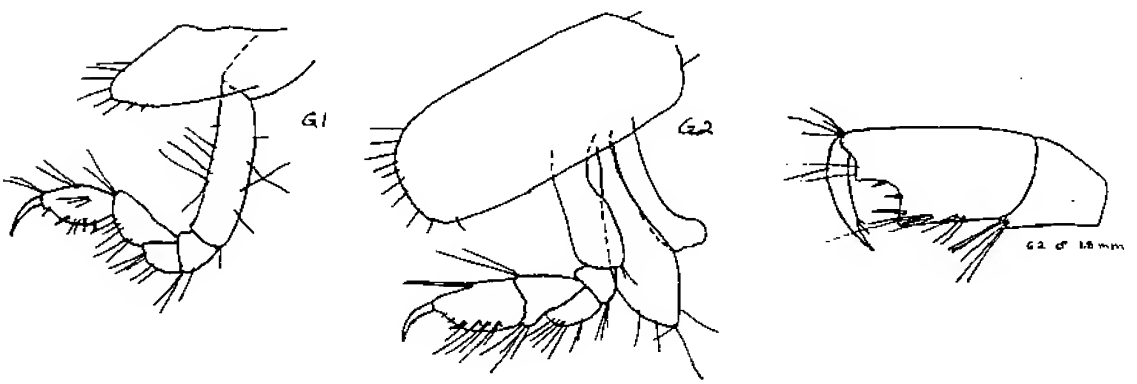
1. Coxae 2, 3, and 4 very long and strap-like, truncate ventrally, coxa 5 large and triangular; together the coxae form a "suitcase" enclosing the pereopods and brood plates.

2. Ventral margin of coxae sparsely setose (setae short and numbering 6-10).

3. Female gnathopods 1 and 2, palm oblique, not well demarcated, but with a defining spine. Male gnathopod 2, palm excavate, but without defining tooth; segment 6 not expanded, dactyl slightly exceeding the palm. (Male gnathopod characters based on probably immature male).

4. Antennal setae very short and located only at end of each peduncular article and on flagellum.





RELATED SPECIES AND CHARACTER DIFFERENCES:

This keys to *P. lacia* in Conlan's (1983) Key to Species of *Photis* of the North Pacific (Females).

DEPTH RANGE: 12-60 m

DISTRIBUTION: Goleta to San Onofre, California

SCAMIT CODE: none

Date Examined: 13 March 1995
Voucher by: Carol Paquette

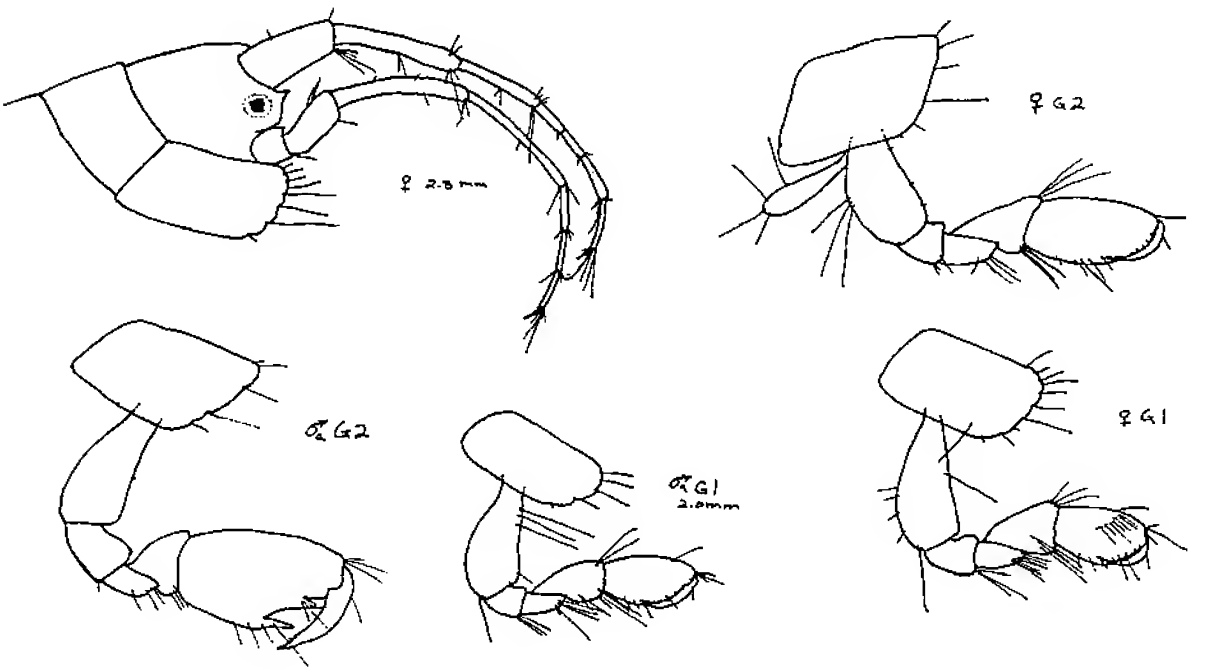
SYNONYMY: *Photis* sp B Paquette 1987

LITERATURE: Conlan, K. E. 1983. The Amphipod Superfamily Corophioidea in the Northeastern Pacific Region, 3. Family Isaeidae: Systematics and Distributional Ecology, Nat. Mus. Canada, Publ. Nat. Sci, No. 4.

SCAMIT newletter, Vol. 7, No. 9.

DIAGNOSTIC CHARACTERS:

1. Eyelobe acute and concavely sided.
2. Body pigmented greyish-white, similar to *Aoroides columbiae*.
3. Antennae sparsely setose, setae short.
4. Antenna 2 peduncle segments 2 and 3 very long and subequal.
5. Coxa 1 with rounded antero-ventral corner andscalloped ventral margin.
6. Eye small and diffuse.
7. Male gnathopod 2 with elongate article 6, dactyl overlapping both palm and the short defining tooth, and a more shallow "v" near the base of the dactyl caused by a large palmar tooth.



RELATED SPECIES AND CHARACTER DIFFERENCES:

1. Can be easily and quickly differentiated from all other local *Photis* by the shape of the eyelobe and body pigmentation.

2. Using Conlan's (1983) key, females key to *P. macinerneyi*, which also has weak antennal setation. However, the characters given above will differentiate them easily.

3. Using Conlan's key, males key to *P. lacia*, except that the gnathopod 2 palmar tooth is not square.

DEPTH RANGE: 30-66 m

DISTRIBUTION: Pt. Conception to Newport Beach, California

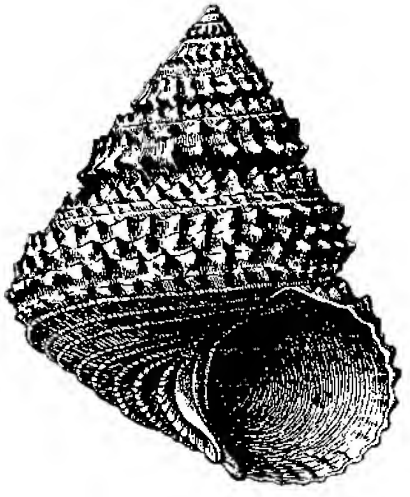
NOTES: Like *P. bifurcata*, this species is mature at very small size (2-2.5 mm). Specimens were taken at Goleta (the shallowest location recorded) from organically enriched sediment containing polychaete tubes, and both drift and attached algae. Co-occurring *Photis* species include *P. brevipes*, *P. californica*, *P. bifurcata*, *P. lacia*, and *P.* sp. A MBC 1972.

July, 1995 SCAMIT Newsletter Vol. 14, No.3

NEXT MEETING:	SCBPP QA/QC Conflict Resolution
GUEST SPEAKER:	none
DATE:	August 21 (Polychaete) and August 22 (Non-polychaete)
TIME:	9:30am - 3:30pm
LOCATION:	SCCWRP, 7171 Fenwick Lane, Westminster (Both meetings)

AUGUST MEETINGS

The data submission deadlines for SCBPP benthic data are looming, and so we are scheduled for two QA/QC conflict resolution meetings in August. The meeting for QA/QC resolution in polychaete taxa will be held at SCCWRP on Monday, the 21st of August, and the meeting for the non-polychaetes will be held on Tuesday, the 22nd of August, also at SCCWRP. Differences should be resolved over the telephone (where possible) prior to 21 August. Meeting time will be devoted to examination of specimens with contested identifications. The polychaete staining patterns meeting originally scheduled for August has been postponed until Monday the



Cidarina cidaris (from Dall 1890)

FUNDS FOR THIS PUBLICATION PROVIDED, IN PART, BY THE ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.

SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

25th of September to allow several vacationing members to attend.

NEW SCA"MITE"

Member Tom Biksey (Baker Environmental) and his wife Germaine became the proud parents of Michael Alexander Biksey on the afternoon of May 3. He was 7 pounds 2 oz. and 20 1/4"at birth. This announcement came a bit slowly, but Pennsylvania is a bit distant. Our congratulations to both Tom and Germaine.

NEW LITERATURE

The members attention was drawn to several new papers at the July 17th meeting. A paper by member Eric Vetter (Vetter 1995) reporting on high crustacean secondary production in nearshore areas of detrital accumulation recently appeared in Marine Ecology Progress Series. His data suggest that areas of natural detrital accumulation are important "hot spots" of secondary production, which is exported by fish predation to a wider area.

Orensanz et al (1995) investigated the breeding biology of *Cancer gracilis* and found it rather complex. This species is often encountered during both benthic and trawl sampling in the Southern California Bight, and additional information on it's biology is most welcome.

An article which may prove to apply to taxonomy of one of our local mollusk species appeared in the latest issue of the *Veliger*. Valdes and Ortea (1995) revise some of the northeast Atlantic species of the nudibranch genus *Okenia*, one of which may occur in southern California. We have had a provisional species (*Okenia sp A*) for several years, which is very similar to *Okenia aspersa* from European waters. It was suspected that the two might be the same, but the limits of variability of *O. aspersa* were unclear. The waters are now even muddier since Valdes and Ortea synonymized *O. aspersa*, *O. pulchella*, *O. modesta*, *O. ascidicola*, *O. inaequalis*, and *O. caudata* with *O. quadricornis*. Most of these synonymies have been suggested in the past, but usually not without argument from other workers. Unfortunately, the authors examined but a single specimen of *O. quadricornis*, which was not the type.

There are several new articles of interest to polychaete workers and other biology-morphs. Vovuelle et al (1995) address quinone-tanning of polychaete tubes and present detailed methods and results. They also closely relate anatomy, tube construction, and histochemistry in some Sabellids. The halogenated process of setal tanning in other polychaetes is also discussed.

A new SEM study of *Glycinde armigera* has been published. This paper (Smith et al 1995) provides new insight into the complexity and possible function of the proboscideal papillae.

Finally, for those dedicated who appreciate being paid for their work: There is a new comprehensive survey of fishery biologists on a state by state basis. The lowest minimum salary? Florida. The highest maximum salary? Michigan and Idaho. If you think you might start packing, get all the data first (Brouha et al 1995).

AMERICAN MALACOLOGICAL UNION MEETING

The 1997 meeting of the American Malacological Union will be held in Santa Barbara on June 22-27 at the Radisson Hotel.

This meeting will be held jointly with that of the Western Society of Malacologists. The two major symposia scheduled are: 1) Deep-Sea Mollusca convened by Jerry Harasewych from the National Museum of Natural History and 2) Traditional vs. Phylogenetic Systematics convened by Gary Rosenberg from the Academy of Natural Sciences in Philadelphia. There will also be a special session on the benthic cephalopods of the North Pacific chaired by Eric Hochberg from the Santa Barbara Museum of Natural History.

The optional field trips will include a tour of fossil formations of the Santa Barbara area, a cruise to the Channel Islands, and an in-depth tour of the Santa Barbara Museum of Natural History. The nightly cost at the Radisson Hotel will be $109 based on double occupancy. After the meeting there will be a two-week long workshop sponsored by the Santa Barbara Museum of Natural History that will focus on the marine, freshwater and terrestrial mollusks of southern and central California.

For more information about this workshop contact Paul Scott at the Santa Barbara Museum of Natural History (805) 682-4711, ext. 319 or inverts@sbmnh.rain.org.

EMPLOYMENT OPPORTUNITY

The City of San Diego is accepting applications for marine biologist. A list will be developed that the City will hire from for the next two years. Currently there is one opening for a marine biologist in the area of data management and reporting. For details please see the attached flyer.

RETIREMENT

Dr. C. Allan Child has retired from his position with the Smithsonian Institution as of the beginning of the year. He is interested in continuing with taxonomy in his retirement, and is available for consulting work. As a world authority on pycnogonid taxonomy and biology he should be in demand. We wish him well in his retirement.

Heterophoxus REDUX

Member Carol Paquette (MBC) took time prior to the meeting to closely examine a series of *Heterophoxus* "*oculatus*" specimens, counting epimeral setae, and posterior setae on article 6 of periopod 6. These closely followed the patterns found by Dean Pasko (CSDMWWD) and reported in the last issue of the Newsletter. She examined 60 animals from a variety of locations and depths, ranging in size from 8mm to 1.9mm in length. Based on her comments a few of the animals can be identified as *H. affinis* or *H. ellisi*. The majority are either *H. oculatus* or *H. conlanae*.

Epimeral setal counts varied between the left and right 3rd epimera of most specimens. The difference was usually just a single seta, but in one case it was 12/8. None of the animals had counts which reached the nominal 20 for *H. oculatus*. The highest count was on a 6mm animal with 13/16. As reported previously, smaller animals have fewer epimeral setae; the 1.9mm specimen had none.

Counts of posterior setae on article 6 of periopod 6 varied both in number of setal groups, and in number of inserted setae in each group between the left and right legs of most animals. Again, both number of groups and setae per group tended to increase with age (size). Only two of Carol's specimens had a triply inserted group. Unfortunately, she did not check for dorsal setation on the pleon in her specimens. Jim Roney (CLAEMD) had noticed the fuzz on his *Heterophoxus* specimens at Hyperion. A request will be

made of Dr. Jim Thomas at the Smithsonian for examination of the holotype of *H. oculatus* to verify the epimeral setal count given by Holmes (1908), and the number of setal groups on the posterior margins of the sixth articles of the sixth periopods. We will also request that the holotype be examined for presence of dorsal fuzz on the pleon. This fuzz seems to be the only unequivocal character separating *H. oculatus* and *H. conlanae* at this time.

Carol has also provided us with a voucher sheet for her *Ampelisca nr. brevisimulata*, which is attached. Perhaps more of these animals will be recognized in our collections now that a voucher sheet is available.

Octopus veligero AT LAST!

Member Megan Lilly (CSDMWWD) reports that they have finally found an additional specimen of *O. veligero* off Pt. Loma. She examined the specimen in the field and found it to differ only subtly from *O. rubescens* in color pattern. The dark markings which were suggested as useful field characters to distinguish *O. rubescens* and *O. veligero* were not seen at this time. However, the animal was viewed out of water and it has been suggested by Dr. Eric Hochberg that distinguishing markings can be observed more clearly if the animal is resting in sea water. It is possible that the dark markings are preservation marks and may not serve as field characters. She confirmed the identification by dissection of the preserved animal when she visited Dr. Hochberg in Santa Barbara. Megan is also working up a report on her maintenance of and observations on living *Octopus* at the CSDMWWD Lab for a future issue of the Newsletter.

INVASION IN FULL SWING

We have been tracking the spread of the introduced cephalaspid mollusk *Philine auriformis* through the Southern California Bight. Gosliner (1995) has recently reprised it's history in northern California, but it's appearance in the south is too recent to have reached publication (except in the Newsletter). The spread of these animals has been very rapid, even if there have been multiple introductions. They are now taken routinely from Santa Monica Bay to off Pt. Loma, and have begun showing up in Los Angeles-Long Beach Harbor (Cindy Fuller, MEC). Snails taken in Los Angeles Harbor were very large, reaching a weight of nearly a gram each. A recent trawl at about 150m off Palos Verdes yielded well over a thousand specimens of various sizes. Given the selectivity of the net, the offshore population must be immense.

Preliminary gut analyses have indicated that the animals are probably indiscriminate carnivores. They reportedly feed on small clams in their native New Zealand (Rudman 1970), and California animals have had *Parvilucina*, ophiuroids, forams, *Pectinaria*, and other cephalaspids in their guts.

Member Cindy Fuller (MEC) reported recently that at least one local fish had begun to make use of the abundant food represented by these muscular and nearly shell-less mollusks. Ed Basmajian (also MEC) found a Pacific sand dab taken off Orange County in August had a gut stuffed with *Philine*.

We are trying to document the rate and path of spread of this animal. Any observations or information on the course of this invasion would be very useful. Members with data please contact Don Cadien (CSDLAC), the unofficial clearinghouse for invasion lore.

Other northern California invaders may be heading our way, the crabs *Eriochir sinensis*

and *Cancer maenas*. Wanted posters for these illegal aliens are attached.

CORRECTION

There was a mistake made in the last newsletter vol. 14 no. 2. on pg. 10 in the last paragraph. The sentence that reads, "The biggest problem seems to be the counts associated with the subdistal papillae on the proboscis." should say, "**distal** papillae", not subdistal. Also, the two species that are being synonymized in Larry Lovell's paper are *Nephtys signifera* with *Nephtys ferruginea* and *Nephtys parva* with *Nephtys cornuta*, not *Nephtys caecoides*. This paper will be in the Proceedings of the 5th International Polychaete Conference from China, which will hopefully be out next year. The secretary apologizes for these errors. All members should feel free to notify the newsletter staff about any mistakes that have been made in the newsletter. The newsletter will only improve with more input from its members.

MINUTES FROM JULY 17 MEETING

The meeting was well attended, and after a recap of the nature of the SCBPP reanalysis process by Dave Montagne (CSDLAC) we proceeded to examine individual problems. Unfortunately, not all the specimens were available at the meeting, so the discussions tended to remain general rather than specimen specific. A number of specific changes did result from examination of voucher or other representative specimens. A sample with CSDLAC as Lab A and CSDMWWD as Lab B was almost completely resolved. As part of examination of this sample nemerteans were compared. These had been identified differently by the two labs. By mutual agreement their identifications were dropped to a higher taxonomic level. It is likely that this solution to conflict in nemertean IDs will be adopted often during the QC process.

Despite circulation of keys to the Families of Ophiuroids, genera of the family Amphiuridae, and species within the genus *Amphiodia* prior to beginning the survey, problems in application still surfaced. Because of the way the family key was structured, small specimens which should have been allocated to the family Amphiuridae based on paired infradental papillae ended up identified as Ophiuroidea unidentified in some samples. A global change to the San Diego database will cure this; but one of many global data changes which will be necessary before the survey data is fully comparable.

Most of the differences between the original and reanalytical labs fell into the category of apparent error - error based on the **precision** of the identification. These are the sorts of error which can easily be resolved between the parties involved.

Since there still seems to be some uncertainty as to the nature of the process the following brief summary was prepared:

a) samples are exchanged
b) reanalysis lab identifies samples
c) original lab provides original data to reanalysis lab
d) reanalysis lab prepares Quality Control Discrepancy Report
e) reanalysis lab sends copy of report to original lab
f) reanalysis lab calls original lab for discussion of items on the discrepancy report
g) differences are worked out over the phone; or
h) samples are prepared for examination at a subsequent SCAMIT meeting to permit differences to be resolved or
i) the labs cannot reach agreement, and the problem is submitted to the Benthic Specialist for summary resolution

j) once resolution is reached (by one of the above three paths) a resolution report is prepared by the reanalysis lab, and submitted to the benthic specialist (cc: original lab) and k) original lab must prepare Request for Taxonomic Change forms (if needed) and submit them to the database administrator (Mary Bergen of SCCWRP).

Anyone with questions about the process or its application should contact either Ron Velarde (CSDMWWD), Don Cadien or Dave Montagne (CSDLAC).

MINUTES FROM JULY 28 MEETING

The meeting opened with Larry Lovell and Leslie Harris reporting to members on the Fifth International Polychaete Conference held in Qingdao, China, July 2-7, 1995, which they attended. Approximately 150-200 people attended the conference. There were several other SCAMIT members in attendance, including Dr. Don Reish, Karen Green, Sheila Byers, and Dr. Amelie Scheltema. There were four days of talks and poster presentations. The Talks were organized around plenary sessions on Evolution and Systematics, Reproductive Ecology, Meiofaunal Polychaetes, and Polychaetes as Marine Pollution and Fouling Test Organisms. All the talks were well received and some were quite controversial. Dr. Reish gave a plenary session talk reviewing the use of polychaetes as marine pollution indicators. Larry Lovell presented a talk on his recent findings in the genus *Nephtys* and Karen Green presented a poster describing a new genus and species of Maldanidae from southern California. Sheila Byers presented a poster reviewing the family Oweniidae in British Columbia. There was also a special session in memory of the late Dr. Ralph Smith presented by Dr. Colin Hermans. There were mid-conference excursions to the Laoshan Mountains, to the beach (collecting polychaetes), and to the First Institute of Oceanography. The Conference Banquet featured a 10 course Chinese meal and entertainment ranging from folk dancers, musicians, and singers to a magic act in which Pat Hutchings almost lost her fingers!!! The hospitality was wonderful, the food great, and the beer cheap! Congratulations to the Chinese for a conference well done.

The conference participants voted Dr. Kristian Fauchald, of the Smithsonian Institution, President of the International Polychaete Society for the next three years. Three presentations on possible locations for the next conference in 1998 were given, they were: Woods Hole, Mass, USA; the island of Helgoland, Germany; and Parana, Brazil. Unfortunately, the time frames of the Woods Hole and Helgoland proposals (April, '98 and September, '98, respectively) meant that those who work at universities would have a difficult time attending. The Brazilian schedule followed the time frame of previous conferences. The participants voted on Brazil for the next conference. It will be in July or August 1998. Dr. Paulo Lana will be organizing the conference. You may E-mail him at <lana@ccc.ufpr.br> with questions or to be put on the mailing list. Paulo indicated there would be a post-conference tour to the Amazon River as an option. Expect the first announcement the latter part of 1996. Make your plans and start saving your cruzeiros.

There were two post-conference tours offered for the Qingdao conference, one to Beijing and a second to Xian and Beijing. Leslie, the Lovells, Karen and Dave Green, and Sheila Byers were part of the second tour with a total of 40 other polychaetologists and family from about nine countries. The tour lasted six days and nights. The first 24 hours were spent on a train traveling 1200 miles from Qingdao inland to Xian. They spent two nights in Xian, where they visited the Terra Cotta soldier tomb and museum and the Wild Goose

Pagoda. The tour then flew to Beijing for three nights. They toured the Summer Palace, Forbidden City, Temple of Heaven, Ming Tomb, and Great Wall, and got to see a performance of the Beijing Opera. It was a fun and interesting group to travel with and everyone got to know one another better.

After the post-conference tour Leslie and the Lovells stopped in Japan for six nights. The Lovell's friend Ko Hirama, who lives in Tokyo, acted as traveling companion while they were in Japan. He had been an ESL student of Jacqueline Lovell in San Diego. Ko had helped with arrangements for Leslie and Larry to visit Dr. Minoru Imajima at the National Science Museum in Shinjuku-ku District, Tokyo. Dr. Imajima hosted a meeting for them all, greetings were made, tea and soft drinks were served, and loan material for Leslie and Larry was processed. Leslie will be examining specimens of *Neriphylla castanea* (Marenzeller, 1879) from Japanese waters and Larry will be reviewing type material from Dr. Imajimas's papers on the families Paraonidae and Nephtyidae (with Takeda). Dr. Imajima honored them with a private tour of the Natural History Museum (only open the afternoon of the first Wednesday of each month). Dr. Imajima retired in March, 1994, but he works at the museum every day and is actively publishing. He encourages the use of the museum collections and welcomes interaction with other polychaetologists to resolve problems of common interest.

Leslie and the Lovells spent three nights in Kyoto where they were able to stay on the grounds of a 900 year old Buddhist temple and experience some of the local Gion Festival. They had met Dr. Isao Hayashi, from Kyoto University , at the polychaete conference and had arranged to visit his laboratory while in Kyoto. He turned out to be quite the host in Kyoto, knowing about transportation and restaurants, taking them to temples, the Gion Festival parade, and special shopping requests. Leslie and Larry got to spend one afternoon in Dr. Hayashi's laboratory at the University and examined a few specimens in the families Syllidae and Nephtyidae. They were very honored for Dr. Hayashi to have spent so much time escorting them. It made for a special weekend in Kyoto.

Proceedings from the 1st International Polychaete Conference in Sydney, Australia are available free of cost due to a surplus of extra copies. Anyone interested should contact Larry Lovell at (619) 945-1608. He will be placing a southern California order with Pat Hutchings in the very near future.

Also, a recent correspondence with Dr. Don Reish has informed members that some copies of the Proceedings from the 3rd International Polychaete Conference in Long Beach are available, also free of cost. Those of you interested should contact:

Dr. Donald Reish
Department of Biology
Calif. State Univ., Long Beach
Long Beach, CA 90804-3702
Fax: (310) 985-4846

Dr. Reish also noted that a second edition of the *Marine Life of Southern California* was printed the end of July. It has been greatly expanded, especially with the larger organisms.

SCAMIT's *Harmothoe* sp. A has been recently described by Gene Ruff (Private consultant in Washington State). He has put it in a new genus because of the shape of its superior and inferior neurosetae. This new genus will appear in the upcoming Polynoidae chapter of the MMS atlas.

The rest of the meeting was spent discussing and trying to resolve some of the discrepancy problems with the polychaete taxa that have developed from the QA/QC reanalysis of the

SCBPP samples.

The first group discussed was Cossuridae. It was decided that the *Cossura* ids. will have to be left as *Cossura* spp. for the SCBPP. Because our *Cossura* problem (see newsletter vol. 14 no.1) was not discovered until some agencies had already finished their cossurid ids. we can not go back and change these without having to look at all the specimens again. With regards to the *Cossura* methyl green stain patterns that we commonly see in the southern California area, SCAMIT is planning on trying to reproduce illustrations of these 2 different patterns on a color xerox for distribution to members. This should help in the differentiation of our two common species in the future.

The next group discussed was Maldanidae. There are many discrepancies between agencies in identification of Maldanids. This is mainly due to the numerous juveniles of this family that were found in the samples and how they were treated by the different agencies. Ids. of Euclymeninae, *Praxillella pacifica*, "*Euclymene grossa newporti*", and *Axiothella rubrocincta* will most likely drop back to Maldanidae to keep the data uniform. There will be more discussion of this problematic group at the next meeting after all agencies involved in the SCBPP have completely finished their QA/QC reanalysis.

Another problematic group discussed at the meeting was Lumbrineridae. Because many of the lumbrinerids found in benthic samples in So. Calif. are small juveniles or anterior fragments each agency tends to identify them differently. Also, the degree to which taxa level the identifications are made is inconsistent amongst the various taxonomists that work with the lumbrinerid group. To keep the data uniform amongst the agencies for the SCBPP many of the ids. will have to be put into one of 2 groups. It was decided at the meeting that group X would include lumbrinerid species with composite setae and group Y would include lumbrinerid species with simple setae.

Group X will include:

Lumbrineris cruzensis
Lumbrineris limicola
Lumbrineris californiensis
Lumbrineris latreilli
Lumbrineris japonica
Lumbrineris index
Lumbrineris Group I and II of SCAMIT

Group Y will include:

Lumbrineris tetraura
Lumbrineris sp. A and B of Harris
Lumbrineris Group III and IV of SCAMIT

It was decided that a few lumbrinerid ids. would stay as they are since these animals are so distinct and reported consistently by all agencies. These include:

Ninoe sp. A of Harris
Eranno lagunae
Lumbrinerides platypygos
Lumbrineris bicirrata

Other problematic groups will be discussed at the next meeting. Those members attending should bring to the meeting any specimens that need to be examined for SCBPP QA/QC resolution.

LITERATURE CITED

BROUHA, P., J. Esson, W. Harris, S. Monseur. 1995. A comparison of agencie's fisheries biologist salaries: 1987, 1990, 1994. Fisheries 20(6):14-18.

SCAMIT CODE: none

Date examined: 12 June 1995
Voucher by: Carol Paquette

SYNONYMY: none

LITERATURE: Barnard, J. L. 1954. Amphipoda of the Family Ampeliscidae collected in the Eastern Pacific Ocean by the *Velero III* and *Velero IV*, Allan Hancock Pac. Exp. Vol. 18, No. 1.

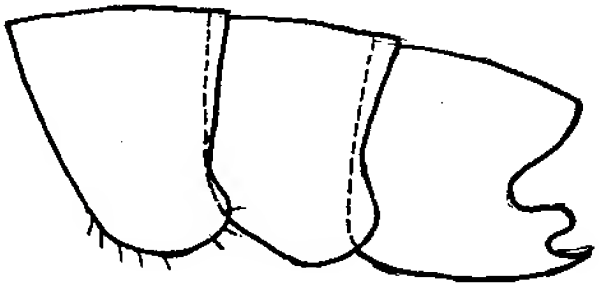
Dickinson, J. J. 1982. Studies on amphipod crustaceans of the Northeastern Pacific region, I. 1. Family Ampeliscidae, Genus Ampelisca, Nat. Mus. Canada Publ. Biol. Oceang., No. 10.

DIAGNOSTIC CHARACTERS:

1. Postero-ventral corner of pleonal epimeron 2 rounded.

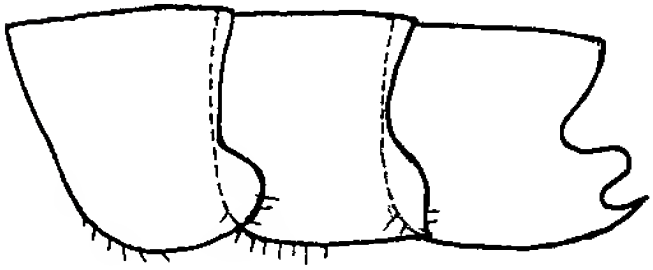
RELATED SPECIES AND CHARACTER DIFFERENCES:

Resembles *Ampelisca brevisimulata* as described by Dickinson in all respects other than pleonal epimeron 2 (although mouthparts have not yet been compared). Barnard did not describe pleonal epimeron 2 in his original description.



Ampelisca nr. *brevisimulata*

9.0 mm female



Ampelisca brevisimulata

9.0 mm female

Left pleonal epimera 1, 2, and 3 (left to right)

Both specimens from Goleta Sta. B1, rep 4, 90 ft, 4 October 1994

DEPTH RANGE: 30 to 90 m

DISTRIBUTION: Goleta to Newport Beach, California

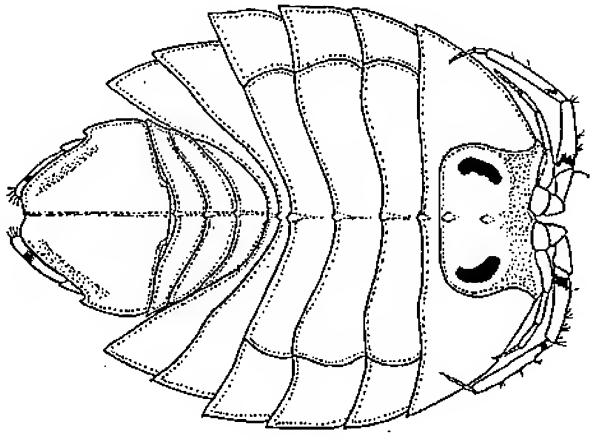
NOTES: The two individuals compared here are both 9.0 mm females with brood lamellae but not gravid. *Ampelisca brevisimulata* and *A.* nr. *brevisimulata* frequently occur together as well as with *A. pacifica*, *A. pugetica*, *A. agassizi*, *A. cristata*, and *A. careyi*. *Ampelisca* nr. *brevisimulata* occurs in about half the samples from off Newport Beach. The proportion of *A.* nr. *brevisimulata* to *A. brevisimulata* in these samples is about 1:3. In the shallower, more northern locations, *A.* nr. *brevisimulata* occurs in less than 4% of the samples, and the proportion of the two taxa is about 1:5.

August, 1995 SCAMIT Newsletter Vol. 14, No.4

NEXT MEETING:	Update of Master Species List
GUEST SPEAKER:	none
DATE:	September 25, 1995
TIME:	9:30am - 3:30pm
LOCATION:	SCCWRP 7171 Fenwick Lane Westminster

SEPTEMBER 25th MEETING

The polychaete staining patterns meeting planned for August and then September will be postponed again until October 16th to allow some members on jury duty and vacations to attend. The meeting on Monday, September 25th will be devoted to additions and emendations to Edition 1 of the SCAMIT Master Species list, many arising from the SCBPP. Members should come prepared with any pertinent changes along with literature to substantiate them. Members with provisionals for addition to the list should bring completed voucher sheets for distribution with the newsletter if they have not yet been circulated.



Serolis carinata
(from Menzies & Barnard 1959)

FUNDS FOR THIS PUBLICATION PROVIDED, IN PART, BY THE
ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.
SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

Those with species list additions which might be controversial (i.e. species not previously reported from the Bight) should bring the specimens on which the record is based for examination during the meeting.

CHRISTMAS PARTY

The yule season is rolling ever closer. Please examine your schedules and consider the following possible dates for the SCAMIT Christmas Party; December 2, 9, and 16. If you have conflicts with other commitments for one or more of these dates, please notify Don Cadien either at a meeting, or at the number listed at the end of the newsletter. We want to select a time when most of the members can participate.

DR THOMAS BOWMAN DIES

We sadly report that Dr. Thomas E. Bowman, who worked productively for decades at the Smithsonian Institution on a variety of crustacean groups, died on 10 August after a prolonged illness. A memorial service was held for him at the Smithsonian on 16 August. Dr. Bowman's distinguished contributions will be sorely missed. He was active in taxonomic pursuits until his death, and had much more to contribute. Obituaries will probably soon be appearing in journals such as Crustaceana, the Journal of Crustacean Biology, and the Proceedings of the Biological Society of Washington. Those seeking more information on Dr. Bowman's life or demise should monitor these sources in the next few months.

NEW LITERATURE

Only one new paper was distributed for examination by the members at the 22 August meeting; a cladistic reexamination of the higher classification of the decapod crustaceans (Scholtz & Richter 1995).

The fourth installment of the Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and the Western Santa Barbara Channel was published 31 August. It is Vol. 12 - Crustacea, Part 3 (Amphipoda). A listing of available volumes, and a schedule of volumes to be released in 1995-96 is attached.

Several other recent papers of possible interest to the membership have been received since the meeting. These concern ultraviolet light impacts on opisthobranch mollusks from shallow marine waters (Carlini & Regan 1995); the spread of the introduced (wanted poster in last newsletter) crab *Carcinus maenas* in central California (Grosholz & Ruiz 1995); and the lack of validity (based on DNA evidence) of a nemertean species strongly separated from it's congener by color and color pattern (Sundberg & Andersson 1995).

THE *Heterophoxus oculatus* TYPE

Through the kind offices of Dr. Elizabeth Harrison-Nelson at the Smithsonian we are now able to examine the type of *Heterophoxus oculatus* to verify and extend the original description and facilitate comparison of the taxon with the recent descriptions of *H. conlanae* and *H. ellisi*. Additional material collected concurrently near the type locality was also included, and hopefully will contain males (the holotype is a female). Results of these examinations will be reported in the next newsletter. The holotype will be available for members to examine at the September meeting.

MINUTES OF THE AUGUST 21 MEETING

Those taxonomists that examined the polychaetes for the SCBPP met at SCCWRP to resolve discrepancies amongst the polychaete taxa resulting from the QA/QC reanalysis process. Many of the discrepancies had already been resolved with telephone

conversations and meetings between taxonomists involved with the project. The meeting consisted mainly of members breaking up into small groups and examining specimens for resolution with other taxonomists providing valuable input when needed. All discrepancies amongst the various agencies were resolved at this meeting. It was also decided at this meeting what should be done with the SCBPP data set concerning the maldanids, polynoids, and sigalionids due to inconsistent identifications within these groups by the various agencies. A list of the changes that need to be made to the data follows.

Those maldanids reported as:

Praxillella pacifica
Euclymene grossa newporti
Axiothella rubrocincta
Euclymeninae

will all change to **Maldanidae**.

Polynoids reported as:

Arcteobia anticostiensis
Arcteobia cf anticostiensis
Harmothoe sp.
Harmothoe sp. B SCAMIT 1990
Harmothoe cf lunulata
Malmgreniella macginitiei
Harmothoe nigralba (sensu SCAMIT)
Malmgreniella nigralba (sensu Pettibone)
Malmgreniella bansei

will change to **Harmothoinae**. Polynoid IDs other than listed above (including *Harmothoe scriptoria*, *H. sp. A*, and *H. hirsuta)* are believed to be correct and consistent among the four labs involved in the project. However, both Hyperion and CSDLAC reported *H. scriptoria* and *H. sp. A* under the genus *Malmgreniella* and will correct this nomenclatural error in their respective portions of the data.

Sigalionids reported as:

Sthenelais berkeleyi
Sthenelais fusca
Sthenelais tertiaglabra

will change to ***Sthenelais sp.*** This is do to the inconsistency amongst the four labs in the recognition of small specimens of *Sthenelais*, particularly *S. berkeleyi*. Reports of *Sthenelais verruculosa* are believed to be correct and consistent among the four labs.

Besides being a very productive meeting for resolving SCBPP discrepancy problems the meeting also gave members a chance to realize what particular taxonomic problems need to be addressed in the future by SCAMIT.

MINUTES OF THE AUGUST 22 MEETING

SCBPP animals other than polychaetes were considered during a meeting at SCWRPP on 22 August. The process of resolution was the same as that described above for the polychaete meeting on the 21st of August. Virtually all taxonomic conflicts which were uncovered during the QC process were resolved during the meeting in one fashion or the other. Some more general topics were not addressed, and were deferred until the synoptic data review meeting. Most significant among these was the question of how to deal with identifications of nemerteans. Although we had all suspected that these animals would be a particularly difficult challenge, the problems discovered during the QC were even greater than anticipated.

Other general problems were settled. The nomenclature used for the three species of the bivalve genus *Tellina* which are routinely taken in wastewater monitoring programs in the Bight was stabilized at the meeting. It was not clear which species of the two pigmented forms was intended to bear the name *Tellina*

carpenteri (the original description of Dall is not explicit). Usage between the members had been uneven, with some ascribing the name *T. carpenteri* to the smooth solid pink form, and others using it for the concentrically sculptured form with yellow-orange pigment flanked by radiating white bands. Yet another nomenclatural practice was use of provisional names for both forms.

Usage was standardized for the purposes of the SCBPP to: the pink form being *T. carpenteri*; the yellow-orange+white rayed form being *T. sp A*, and the concentrically sculptured white form being *T. modesta*. All groups had already been using *T. modesta* this way. The allocation of the *T. carpenteri* name was based on the definition of *T. carpenteri* to be adopted in the forthcoming Bivalve Seashells of Western North America.

John Ljubenkov (MEC) pointed out that this usage would render a provisional name unnecessary, since the yellow-orange+white rayed form was the same as described by Hertlein and Grant as *T. arenica*. Subsequent discussion with Paul Scott (SBMNH) indicated that the two forms differ; with *T. arenica* a valid Panamic species, and *T. sp A* still needing a new name. It will be described in the book mentioned above (currently in manuscript).

Mary Bergen (SCCWRP) has determined that identification of sea-cucumbers of the genus *Leptosynapta* to species level is not currently warranted. The taxonomy of the species in our area is too unsettled, and the historic usages too tangled for specific level identifications to be useful. We agreed that for the purposes of SCBPP *Leptosynapta* (like *Chiridota*) would be left at *Leptosynapta sp.* Sewell et al (1995) provide redescription of *Leptosynapta clarki* which may help clarify the situation, but this is too recent to offer assistance in time to affect the SCBPP data.

Doug Diener (MEC) illustrated characteristics of the three species of the isopod genus *Edotia* currently recognized in the Bight. Since few reports of the two provisionals erected by MEC (*Edotia sp A* and *Edotia sp B*) have come from outside his group, it is likely that the two provisionals have not been recognized by most agencies, and that SCBPP data for this genus are thus unreliable. The genus *Edotia* in the northeastern Pacific was recently (Rafi & Laubitz 1990) reviewed. It is not certain that the animal they identified as *E. sublittoralis* from western Canada is the same as that described from southern California by Menzies and Barnard (1959). There are a number of differences in detail between the two forms (as pointed out by Rafi & Laubitz) and the wide geographic separation between the two is suggestive. The lack of intermediate reports may reflect only publishing patterns rather than animal distributions. There is, for instance, a report of *Edotia sublittoralis* from the San Francisco area in the 1983-84 Ocean Outfall Monitoring Program Annual Report for the San Francisco Department of Public Works, Bureau of Water Pollution Control.

Problems in nomenclature in the amphipod genus *Protomedeia* are also suspected. It is unclear whether the *Protomedeia articulata* and *Protomedeia prudens* of Barnard (1962, 1966) are the same as those of Conlan 1983. Given this ambiguity, and the common use of all the above literature in the identification process by some or all of the participating agencies, it was deemed best to not take SCBPP *Protomedeia* identifications to specific level. For the purposes of the SCBPP all *Protomedeia* will be identified as *P. sp.*

Based on the QC reexaminations it was suspected that inconsistencies existed between laboratories in identification of the following genera: *Bittium* (gastropod); *Ophiodermella* (gastropod); and *Gnathia* (isopod). Problems or inconsistencies were also suspected in the taxa pairs *Synidotea media/magnifica* (isopod);

Amphiura acrystata/sp and *Amphioplus hexacanthus/strongyloplax* (ophiuroids); and *Foxiphalus cognatus/obtusidens* (amphipod). These and similar problems as yet unidentified will be addressed during the synoptic review of the submitted SCBPP data. At that point, most of the decisions will be brief, summary, and apply only to the SCBPP. Further consideration of these problems and their broader import can be given during the master species list review in September.

JOB OFFERINGS

Positions as Curatorial Assistant in the Crustacea and Worm Laboratories of the Natural History Museum of Los Angeles County are now open. Call Leslie Harris @ 213)744-3234 for information on the worm position. Applications must be in by 20 September (Crustacea), so act now if interested (see attachment)!

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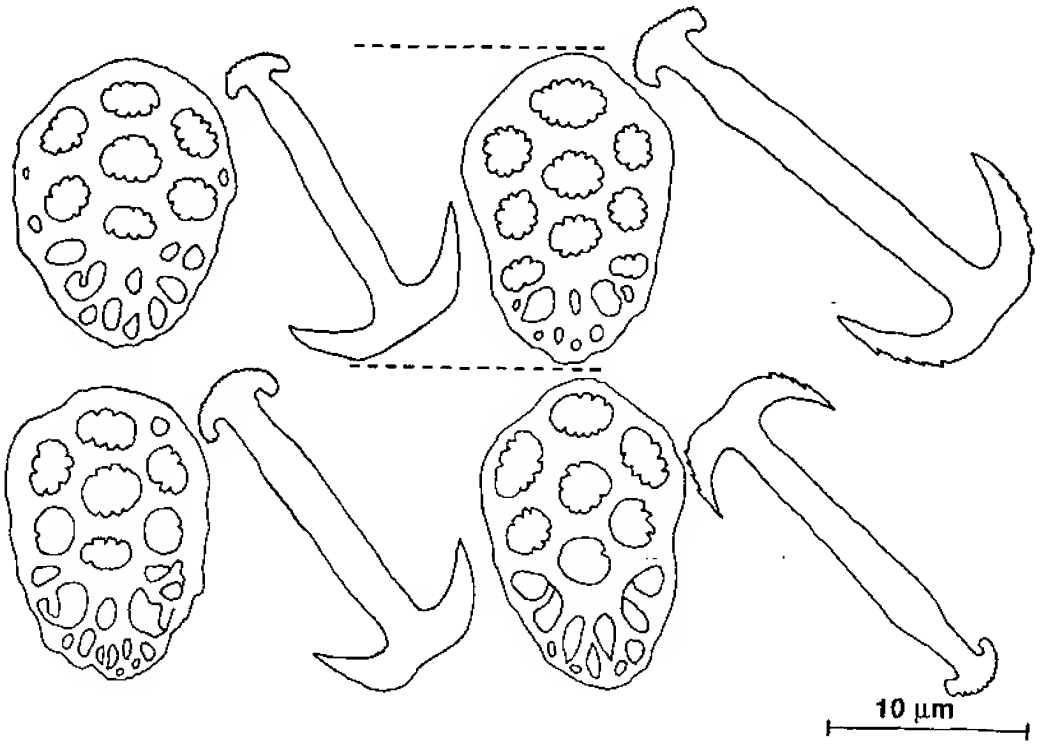

Variations in anchor and anchor plate spicules in *Leptosynapta clarki* (from Sewell et al 1995)

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If you need any other information concerning SCAMIT please feel free to contact any of the officers.

President	Ron Velarde	(619)692-4903
Vice-President	Don Cadien	(310)830-2400 ext. 403
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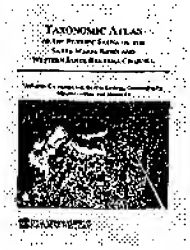

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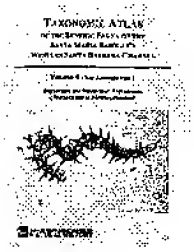

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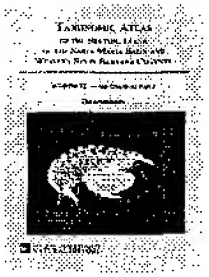

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For further information contact:
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2559 Puesta del Sol Road, Santa Barbara, CA 93105 USA
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List of volumes and authors to be published in 1995 - 1996

Volume 3 - The Cnidaria

Daphne G. Fautin, University of Kansas
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Volume 5 - Polychaeta, Part 2 (to be published in October 1995)

James Blake, Science Applications International Corp.
Brigette Hilbig, Science Applications International Corp.
Jerry Kudenov, University of Alaska, Anchorage
Leslie Harris, Natural History Museum of Los Angeles County
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Volume 6 - Polychaeta, Part 3

James Blake, Science Applications International Corp.
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Volume 8 - The Mollusca, Part 1 (Gastropoda) (to be published in October 1995)

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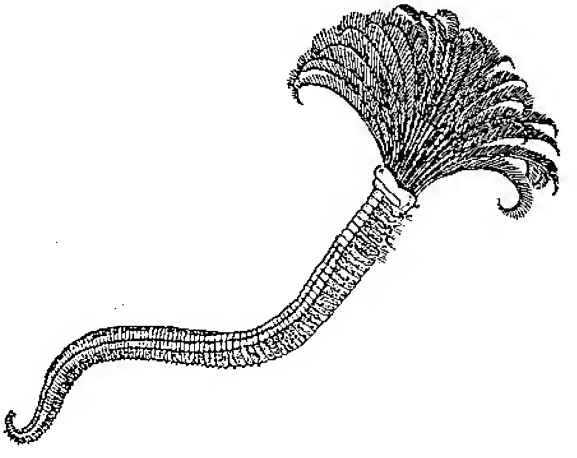
September, 1995 **SCAMIT Newsletter** Vol. 14, No. 5

NEXT MEETING:	Staining Patterns in Polychaetes
GUEST SPEAKER:	none
DATE:	October 16, 1995
TIME:	9:30am - 3:30pm
LOCATION:	City of San Diego Marine Biology Lab 4918 N. Harbor Dr. Suite 201 (upstairs) San Diego (see enclosed map)

OCTOBER 16th MEETING

This meeting will finally cover staining patterns in polychaetes. Hopefully, the postponement of this meeting by two months will now allow all members interested the opportunity to attend. Members should come prepared to discuss their personal staining techniques and the various stains they use. It may be helpful if members brought any illustrations of staining patterns, actual specimens that exhibit particular staining patterns, and any literature that discusses staining methods and techniques or specific patterns to this meeting. Members may also want to review the article written by Tom Parker (CSDLAC) that appeared in the



Megalomma
(from Light's Manual 3rd ed. 1975)

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SCAMIT newsletter (Vol. 13 No. 12). In this article Tom raised several questions about staining techniques and the use of staining patterns in taxonomy. We hope to address these questions and probably raise several more at the meeting.

SPECIAL NEMERTEAN MEETING

On Friday, October 27th there will be a meeting hosted by John Ljubenkov (MEC) at his home to discuss and, hopefully, resolve some of the problems with the nemerteans. This is intended to be a small, informal, but productive meeting. Anyone interested should contact John @ (619) 931-8081 for directions to his home.

NOVEMBER MEETING

The November meeting is tentatively scheduled for the 13th. This will be a second meeting to discuss the additions and emendations to the first edition of the SCAMIT Taxonomic List. The second edition of the Taxa List will hopefully be finished and distributed to members by the end of the year. This meeting will be the last chance for members to make any changes to the list. Members with provisionals for addition to the list must bring voucher specimens for review and voucher sheets for distribution in the newsletter, if they have not already done so. This includes all provisionals from the SCBPP. Without voucher specimens and voucher sheets, or substantial documentation, they can not be included in the Taxa List. Also, many species level identifications from the SCBPP and regular monitoring programs have raised questions amongst the membership in a recent SCBPP meeting. SCAMIT members using these questionable names have been notified and will need to bring specimens for review by other SCAMIT members at the meeting. They should also bring literature and documentation to support their identification. The location of the meeting has not yet been determined, but will be announced in the next newsletter.

CHRISTMAS PARTY

At the last meeting members were asked about a possible date for the SCAMIT Christmas Party. Most members at the meeting seemed to think December 16th was a good choice. We would like to schedule the party when the majority of the members that would like to attend can do so. If this date does not fit into your social calendar and you and your family would like to attend please contact the Vice President as soon as possible. Perhaps an alternate date may be more suitable.

NEW LITERATURE

Volume 12 of the MMS Taxonomic Atlas is now out. It is part 3 of the Crustacea and covers amphipods. Unfortunately, it could not contain taxonomic changes published in the journal *Amphipacifica* and elsewhere within the last year. Please see the flyer in the last newsletter (Vol. 14 no. 4) for more information.

Description of a new species of the holothuroid genus *Cucumaria*, along with a redescription of *Cucumaria miniata* were provided by Kirkendale & Lambert (1995).

Between the meeting and the production of this newsletter *Amphipacifica* Vol. 2 No. 1 was received. It has two articles which pertain to west coast amphipod taxonomy; one dealing with the haustoriid genus *Eohaustorius* (Bousfield and Hoover 1995), and one with pleustids (Bousfield and Hendrycks 1995). The pleustid article in particular modifies existing taxonomic practice in our area. The changes derived from it will be discussed later in this newsletter.

MINUTES FROM SEPTEMBER 25 MEETING

The first half of the meeting was spent discussing the changes and additions that needed to be made to the first edition of the SCAMIT Taxa List. It has come to the membership's attention that many of the provisionals included in the Taxa List do not have voucher sheets or descriptions that have been fully distributed. Since this list is for regionally occurring macroinvertebrates it is important that voucher sheets be widely available for all members to use. When the list was originally created many provisionals were included that didn't have voucher sheets because they were in the process of being completed or were "promised" in the near future. It has been decided that for a provisional to be included in the second edition of the Taxa List it must have substantial documentation and that the documentation must be widely distributed throughout SCAMIT, mostly by means of the newsletter. Substantial documentation includes a description of the named organism with a differential diagnosis and illustrations. This will hopefully be in the form of a voucher sheet, but does not have to be. For those members that need help with a voucher sheet CSDLAC has a blank template of an appropriate voucher sheet that members may obtain an electronic copy of. Please contact Don Cadien or Cheryl Brantley @ (310) 830-2400 ext. 403.

Dave Montagne (CSDLAC) has prepared a checklist of all the provisionals that were included in the first Taxa List. This checklist is being distributed to the labs of the POTWs and several consulting firms in the southern California Bight involved with SCAMIT. This checklist is designed so members may check off which provisionals they have documentation on and if this documentation is in the form of a voucher sheet, key, illustration, or description. This checklist will then enable SCAMIT (at the Nov. 13 meeting) to decide which provisionals need further documentation, which provisionals need to have their documentation redistributed thru the newsletter, and which provisionals should merely be dropped from the list.

It was suggested at the meeting that SCAMIT should set up a separate file to keep track of the documentation on past provisionals and their status. This file could be added to in the future. The file could also have an electronic version and all future voucher sheets of provisionals could be submitted on disk, not only for easier inclusion in the newsletter, but for ease with future changes. All members present thought this suggestion would be very useful. The only problem presented by this suggestion is finding the person to organize this provisional file. Any volunteers?

At the meeting a list of additions and emendations created by CSDLAC for the SCAMIT Taxa List was distributed to the members present for their comments. Several additions were made and some changes due to incorrect alphabetical sequence and authorship were made. This list will be added to at the November meeting. It was proposed that trawl-caught invertebrates be included in the 2nd edition of the Taxa list. No members present voiced any objections to this proposal.

MORE CHINA NOTES

Dr. Don Reish submitted the following comments on his experiences during his trip to the polychaete conference in China and a few other subjects.

"Additional comments on the 5th International Polychaete Meeting. The changes that have occurred in Qingdao since my visit in 1982 were spectacular. Autos now outnumber bicycles, a good share of which are privately owned taxis. Sidewalk shops are everywhere;

none occurred in 1982. Multistoried buildings are being built all over the city. I stayed in the same hotel in 1982 only they had added a 25 story addition complete with a revolving restaurant. Several of us visited Prof. Wu in the hospital; he has been there since last December. I'm not sure if he will ever return to polychaetes.

Contrary to the SCAMIT newsletter, I did not present a plenary presentation on the use of polychaetes as marine pollution indicators, but on the use of polychaetes in marine toxicological testing.

Pei-Yuan Qian and I will serve as co-editor of the proceedings which are to be published in the Bulletin of Marine Science. I had met Pei-Yuan in Qingdao in 1982 and got him interested in *Capitella capitata*. He received his PhD from the Univ. of Alberta (my mothers college when it was a normal school). He is now on the faculty at Hong Kong.

I will continue to serve as secretary-treasurer of the organization and will be editor of the proceedings of the Brazilian conference which will again be published in the *Bulletin of Marine Science*.

We have been trying to obtain field-collected specimens of *Neanthes arenaceodentata*. We have tried many of the bays and mouths of rivers including Ensenada with no success. If you have encountered this species in samples collected since April 1995 please get in contact with me (310-985-4846). We want to compare the toxicity of field collected specimens to my lab population; this hasn't been done since Phil Oshida did it in the 1970's.

The second edition of Marine Life of Southern California is out, but it probably will not be available in college bookstores for a couple of months. It sells for $20.00. There are about 150 new drawings, done by my daughter, an expanded introduction, and about 100 additional organisms added."

COMMENTS ON THE AMPHIPOD SECTION OF THE TAXONOMIC ATLAS

The long awaited and recently released amphipod portion of the *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel* is likely to serve as a convenient and often used source for identifications of amphipods from the southern California Bight. There has been no similar compendium of regional amphipod information at the species level since Barnard's section of Light's Manual in 1975. In light of this usage it the following comments on the publication are offered.

1) Coverage. While dealing with quite a few species which also occur within the southern California Bight, the amphipod Atlas addresses only those species which were reported in the Phase I and Phase II reconnaissance surveys of the Santa Maria Basin undertaken by contractors for the Minerals Management Service. Consequently, there are many species common in the Bight (especially in southern inshore waters), which are neither discussed nor represented in the keys in the Atlas. The family Lysianassidae (s.l.) is not treated here, but will be included in a future volume. The keys and species descriptions in the Atlas will be very useful to local amphipod workers **only** if it is remembered that they are not comprehensive.

2) Timing. Because of the relative completion of the manuscript at the time of appearance of recent monographic revisionary papers published in *Amphipacifica* in 1994 and 1995 these revisions were not incorporated into the Atlas. The results of the extensive SCAMIT amphipod discussions undertaken as part of identifications of the SCBPP collections were also not timely for inclusion in the Atlas. All of the authors of the volume were also

physically distant from the Bight, and in at best intermittent contact with local workers. They were thus not in a position to evaluate the relevance and reliability of our observations.

A list of taxa where differences between current SCAMIT usage and/or recent publications was evident follows. The first name is that in the Atlas, the second that of SCAMIT or indicated authors.

Eusirus longipes → *Eusirus columbianus* (Bousfield & Hendrycks 1995a)

Rhachotropis spp → see Bousfield & Hendrycks 1995a

Melphisana bola → recognized as a variable complex of more than one species by SCAMIT

Bathymedon pumilis → correctly *pumilus*

Heterophoxus oculatus → see revision of genus by Jarrett & Bousfield 1994

Parametaphoxus fultoni → *P. quaylei* Jarrett & Bousfield 1994

Paraphoxus oculatus → *P. sp 1* of Jarrett & Bousfield 1994

Garosyrrhoe disjuncta → recognized as part of an unresolved species complex by SCAMIT

Urothoe elegans → what we have called *U. varvarini* in the Bight

[*Ampelisca careyi*] → synonymy with *A. unsocalae* not recognized by SCAMIT

Ampelisca hancocki → recognized as part of an unresolved species complex by SCAMIT

Parapleustes pugettensis → west coast records allocated between several species in several genera by Bousfield & Hendrycks 1995b

Pleustes depressa → *Thorlaksonius depressus* (see Bousfield & Hendrycks 1994b)

Protomedeia spp → currently viewed by SCAMIT as not clearly differentiable in the female

Photis spp → see comments in Newsletter Vol 13#12 and Vol 14#1

Hemiproto wigleyi → *Hemiproto sp A* of SCAMIT. Watling's identification as *H. wigleyi* may be correct, but more material than the six specimens examined by him during this study will be needed to establish the presence of this Atlantic species in California.

Don Cadien

PLEUSTID REVISION, PART III

The recently received third part of the Bousfield & Hendrycks revision of the family Pleustidae in the north Pacific has major implications for pleustid identification in the Bight. Part I (Bousfield & Hendrycks 1994a) did not deal with species level problems, while Part II (Bousfield & Hendrycks 1994b) addressed the subfamily Pleustinae, which is poorly represented in temperate north Pacific waters. The present installment (Bousfield & Hendrycks 1995b) deals with the subfamilies Parapleustinae, Dactylopleustinae, and Pleusirinae, which contain the majority of the California species.

Rather than attempt to cover case by case the changes introduced in this paper I have prepared a table which summarizes the differences between the SCAMIT ED1 list and Bousfield & Hendrycks 1994b and 1995b. Entries in the Author column are keyed to Bousfield & Hendrycks unless there is a NOL (not on list) in that column. In that case authors refer to the SCAMIT ED1 column. Where a species is listed more than once in the ED1 column it indicates that the taxon has been split and/or restricted by Bousfield & Hendrycks. Species listed as NOL under B & H are either in a subfamily not yet treated by them, or do not range into their area of coverage (*Dactylopleustes sp A*).

Review of the haustoriid genus *Eohaustorius* in the north Pacific (Bousfield & Hoover 1995) led to separation of southern identifications of

Eohaustorius washingtonianus as a new species,
E. barnardi -Don Cadien

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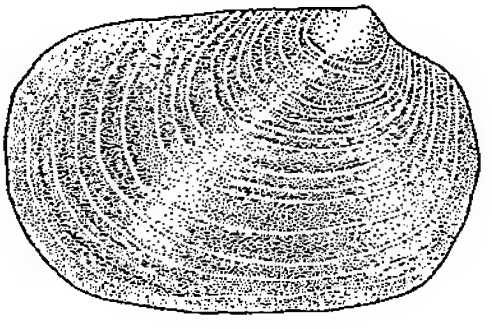
October, 1995 SCAMIT Newsletter Vol. 14, No.6

NEXT MEETING:	Update of Master Species List
GUEST SPEAKER:	none
DATE:	November 13, 1995
TIME:	9:30am - 3:30pm
LOCATION:	SCCWRP 7171 Fenwick Lane Westminster

NOVEMBER 13th MEETING

This meeting will be to finish updating the SCAMIT Taxonomic List of Macroinvertebrates. Members should bring any additions or emendations for the list with them to the meeting along with appropriate documentation to support these changes. Also, at this meeting voucher sheets of provisionals that are to be included in the Taxa List should be complete and turned in to Don Cadien for inclusion in the newsletter. The second edition of the List should not have any provisionals included that do not have substantial documentation to support them or documentation that has not been widely distributed to SCAMIT members by means of the newsletter.



Mysella sp B (drawing by Laurie Marx [SBMNH]- from voucher sheet by Dr.Paul Scott in SCAMIT Newsletter 7(2)

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SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

This includes all provisionals from the SCBPP. If they are going to be included in the second edition of the Taxonomic List then the voucher sheets or descriptions need to be distributed to the membership. Also, we will review specimens with questionable species level identifications on both the SCBPP list and Edition 1 Taxa List. SCAMIT members that have these specimens should bring them for examination by the membership. The meeting will be held at SCCWRP. Anyone needing a map or directions may contact the SCAMIT secretary.

NEW BROCHURES

New SCAMIT brochures have been completed by treasurer, Ann Dalkey. The text and graphic images in the brochures has remained the same, but the layout has changed and so has the paper stock. It is now an attractive pale gray with a navy blue border. Most importantly, though, since Ann created these brochures on her computer using WordPerfect 6.0 for Windows they can be printed out whenever SCAMIT runs out. We all owe Ann our appreciation for a job well done.

CHRISTMAS PARTY

The SCAMIT Christmas Party has been scheduled for December 2nd at Cabrillo Marine Aquarium. It will be a potluck with SCAMIT providing the main entree and drinks. Please contact Vice President, Don Cadien if you and your family will be able to attend. The more the merrier!

CHAETOZONE

Subscribers of the electronic newsletter *Chaetozone* recently received some important news from editor Dr.Geoff Read. It seems that *Chaetozone* is being given the opportunity of moving as a group to the BIONET system of newsgroups and mailing lists for professional biologists. It is planned that there will be an automatic mailing list called *Annelida* that will run from net.bio.net in the USA. After 6 months *Annelida* will be voted on as a proposed USENET newsgroup, tentatively called bionet.organisms. annelida. USENET readers will be able to read it in the much more convenient newsgroup format. It only needs 80 "yes" votes to become a USENET newsgroup and mailing list. If it should fail to get this many votes then the mailing list will cease. After issue 9 of *Chaetozone* is complete it will be put on hold to see how *Annelida* performs. However, Dr. Read will continue to compile the *Polychaete Researcher Online* editions and updates. More information on this will be in upcoming newsletters.

INTERNET NEWS

U.S. Fish and Wildlife service has 2 new servers on Internet that may be of interest to SCAMIT members. Coastal ecosystems may be accessed thru http://www.fws.gov/~ceplcepcode.html and wildlife laws thru http://www.fws.gov/~pullenl/wildlaw/fdigest.html.

NEW LITERATURE

Although not directly concerning taxonomy, a recently received publication on polychaete life history should be of interest to the membership. This article, "Sex economy in benthic polychaetes" (Premoli, M.C., and G. Sella. 1995 -Ethology, Ecology & Evolution 7:27-48), discusses sexual lability in sequential hermaphrodites, and its basis in energetics. In one dorvilleid, for instance, "male reproductive success declines with increasing size because females prefer to mate with small males to avoid a costly conflict over sex. Moreover both partners of a pair can simultaneously change sex several times after some spawnings." Life do get complicated, don't it?

MOLLUSK WORKSHOP

A mollusk workshop has been tentatively scheduled for 18-19 November at the Seattle Aquarium. This workshop, held under the auspices of NAMIT - our sister organization to the north - has sessions devoted to cephalopods, gastropods, nudibranch gastropods, scaphopods, chitons, and bivalves on its tentative agenda. More information, and confirmation or modification of the dates should be available from Roberto Llansó, NAMIT secretary/treasurer @ (360)407-6992, or rlla461@ecy.wa.gov . The agenda and a membership application for NAMIT are attached.

MINUTES FROM OCTOBER 16

This meeting began with the members present creating a table of staining pattern use for various species of polychaetes. This table has been included in this newsletter. The table is organized by family and includes only those species or families that have been stained, whether it has been successful or not. The table includes the particular lab or individual SCAMIT member and which stain they have used in polychaete taxonomy. The purpose of staining is included in the table because often the reason for staining a specimen is not for a diagnostic pattern, but to highlight small structures that are sometimes hard to see, but are important to the diagnosis. These may include dorsal and interramal cirri, papillae, branchial scars, setal fascicles, etc. Also, sometimes a stain pattern may not be species specific, but indicative of a generic group or complex of species. We have also tried to note this in the table. The table also provides a place where an illustration or description of the stain pattern may be found, whether it is in a SCAMIT voucher sheet or an individuals personal illustration.

After this table was created we discussed the various stains and staining techniques used by the members present. There are basically 4 major stains used by SCAMIT members. A brief description of their use is given below.

Alcian Blue

Also called Ingrain Blue. This is a permanent stain and does not wash out. It is used mainly to highlight small structures for ease in viewing by the City of San Diego's lab. To use this stain a saturated solution in 70% ethanol should be prepared. A specimen only needs to be placed in the stain for a few seconds to absorb the pigment and then rinsed in 70% ethanol. If another non-permanent stain (like methyl green) is going to be used on the specimen it should probably be used first so that this permanent blue pigment won't interfere with a diagnostic pattern. This stain may be obtained from EM Science under the name Alcian or Ingrain Blue 8GX. The colormetric index to request is 74240. It is believed that this number is similar to a dye lot # and, therefore, might make a difference in the consistency of the stain color.

Methyl or Methylene Green

This is not a permanent stain, it will eventually fade out completely. It has been the most widely used stain by SCAMIT members. There are many polychaete species that seem to exhibit a diagnostic pattern using this stain. Please refer to the table on methyl green staining techniques in this Newsletter to see how this stain is used. This stain may be obtained by Eastman Kodak or Fisher Scientific. The colormetric index is 42590.

Methyl or Methylene Blue

This also is not a permanent stain and will fade out completely. It has just recently been used by Tom Parker (CSDLAC). Please refer to Tom's attached handout entitled, "A Colorful Primer" for the specifics on this stain. Two of the advantages of this stain are the quick uptake (less than 1 minute) of the pigment by the specimen and the two different color hues that are exhibited by

some species. The colormetric index is 52015 and J.T. Baker Chemical Co. is the manufacturer.

Rose Bengal

This is a permanent pink stain, which has generally been used by taxonomists as a visual aide to help sort animals from debris in samples. This has been found especially useful for deep sea samples where the specimens are so small. The City of San Francisco's lab uses a dilute solution of this stain when fixing their samples. This especially helps them in the sorting of their 0.5 mm screen samples. They have found that a dilute solution of rose bengal that is rinsed out throughly before preservation in alcohol does not significantly interfere with the use of other stains, such as methyl green. They also found that rose bengal leaves a particular pattern that helps them identify specimens of *Magelona sacculata*. This diagnostic pattern is not exhibited when these specimens are exposed to methyl green.

In the afternoon we had a round table discussion of the various staining techniques we all used. A table was created and is included in this newsletter. This table is merely for the use of methyl green, since this stain is used most frequently by SCAMIT members. From looking at the table it is apparent that the techniques are similar, but with some notable exceptions. Until this time no member had any particular formula for making a stain solution. No one knew how many grams of stain powder were mixed in how many milliliters of ethanol. The standard practice has been to mix enough stain powder in alcohol to obtain a saturated solution. Another difference in techniques is the length of time a specimen is stained. This seems to be dependent on how many specimens are being stained at one time and whether or not the taxonomist has time to wait for the stain to penetrate or must concentrate on other work in the interim. For example, the "2-day" notation refers to specimens that have been left in a stain bath over the weekend. This was not done because the pentration of the stain took that long, but was merely for the convenience of the taxonomist. Also, the longer a specimen is left in a stain bath the more excess stain there will be to rinse off (or de-stain) to allow the taxonomist to see the diagnostic pattern, if one exists. The time periods given in the table are approximations, since no one has ever timed their staining process before.

In the afternoon, Tom Parker (CSDLAC) showed members some of the specimens that he had stained with methylene blue. This gave members a chance to see for themselves that, not only was the stain uptake faster than methyl green, but the metachromatic reaction of the methylene blue produced stain patterns with two colors. The two colors were a blue or greenish-blue and a purple or purplish-blue. Please see Tom's informal observations in his "A Colorful Primer" for the species that have been tested with this stain so far.

We next examined the stain pattern for *Magelona sacculata* that has been seen by the City of San Francisco's polychaete taxonomists. Kathy Langan brought to the meeting a few specimens of theirs with the rose bengal pattern. We put these specimens and some specimens from the City of San Diego's lab in methyl green but did not see this same pattern. The rose bengal pattern is bright pink spots that are exhibited dorsally on each setiger in a slight cresent shape at the anterior end. The methyl green stain did not produce any distinguishable pattern.

Larry Lovell also showed members the way methyl green stain will help distinguish between species of *Sabellides* and *Asabellides*. *Asabellides* exhibits a dark staining patch or area behind the branchiae anteriorly and *Sabellides* does not. This is especially useful for small or tiny animals.

The meeting concluded with Tom Parker giving all the members present some of his stock solution of methylene blue for them to experiment with. We concluded that this topic of staining patterns in polychaetes will definitely be ongoing. We anticipate publishing more on this topic in future newsletters, especially the results of the methylene

blue stain after more research has been done.

Members who were not able to participate in the staining workshop are encouraged to review these materials and comment by letter or e-mail to the editor for inclusion in future Newsletters. The editor's (Don Cadien's) e-mail address is: **mblcsdla@netcom.com.**

The table on polychaete staining pattern use will be updated periodically with input from its members so please feel free to send any additions or changes to the editor. The experiences of all members can contruibute to the continuing dialogue on use of this important tool.

METHYL GREEN STAINING TECHNIQUES

Agency	Conc. of stain	Length of stain	Length of de-stain
LAC	2g./100 ml.in 70% ethanol	15 min.- 2 days	15 min.- 40 min.
HYP	sat. solution in 70% etoh.	15 min. - 2 hrs.	Brief
SD	sat. solution in 70% etoh.	10 min. - 2 days	5 min. - 15 min.
SD*	sat. solution in 70% etoh.	30 min. - 2 hrs.	15 min.
L. Lovell (MEC)	sat. solution in 70% etoh.	15 min. - 2 days	1 min. - 15 min.
MBC	sat. sol'n in 70% isopropanol	10 min. - 2 hrs.	5 min. - 30 min.
SF	sat. solution in 70% etoh.	5 seconds	rinse

* Rick Rowe at the City of San Diego's lab prefers this technique of staining. He lets the organisms sit in the stain bath until most of the alcohol has evaporated in the small petri dish. He feels this provides a more intense stain pattern. Other members of the lab do not use this technique.

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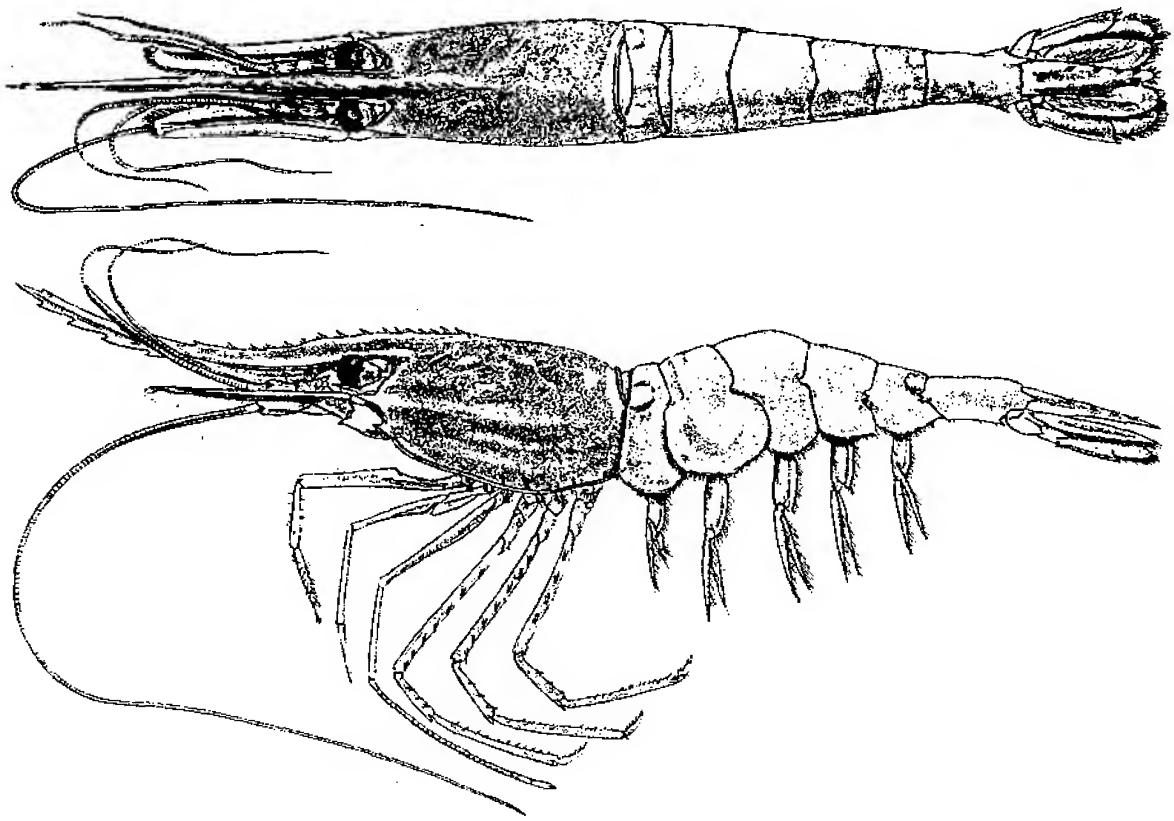

Top and side views of *Pandalus platyceros* - the spot prawn, from Butler 1980 (Shrimps of the Pacific Coast of Canada. Canadian Bulletin of Fisheries and Aquatic Sciences 202)

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POLYCHAETE STAINING PATTERN USE

Species Name	Type of Stain [1]	Lab or Person [2]	Purpose [3]	Illustration/ Documentation [4]
Family Orbiniidae				
Leitoscoloplos panamensis	MG	LAC	Highlight	none
Leitoscoloplos pugettensis	MG	L. Lovell	Highlight	none
Scoloplos acmeceps	MG	L. Lovell	Highlight	none
Scoloplos acmeceps profundus	MG	L. Lovell	Highlight	none
Scoloplos "armiger"	AB/MG	SD	Highlight	none
Family Paraonidae	AB	SD	Highlight	none
Family Cossuridae				
Cossura brunnea	MG	L. Harris	Diagnostic	Illustration of type
Cossura candida	MG	All	Diagnostic	R. Rowe has illust./L. Harris has illust. of type
Cossura delta	MG	L. Harris	Diagnostic	Illustration of type
Cossura modica	MG	L. Harris	Diagnostic	Illustration of type
Cossura pygodactylata	MG	L. Harris	Diagnostic	Illustration of type
Cossura rostrata	MG	L. Harris	Diagnostic	Illustration of type
Cossura sp. A	MG	All	Diagnostic	R. Rowe has illustration
Family Spionidae	AB	SD	Highlight	none
Apoprionspio pygmaea	MG	L. Harris	Diagnostic	Illustration
Dispio uncinata	MG	L. Harris	Diagnostic	Illustration of type
Laonice appelloefi	MG	L. Harris	Diagnostic	Illustration
Laonice cirrata	MG	L. Harris	Diagnostic	Illustration
Paraprionospio pinnata	MG	L. Harris	Diagnostic	Illustration
Prionospio lighti	MG	L. Harris	Diagnostic	Illustration
Prionospio sp. A	MG	L. Harris	Diagnostic	Illustration
Prionospio sp. B	MG	L. Harris	Diagnostic	Illustration
Rhynchospio glutaea	MG	L. Harris	Diagnostic	Illustration
Spiophanes anoculata	MG	L. Harris	Diagnostic	Illustration of type
Spiophanes anoculata	AB	SF	Highlight nuchal ridges	none
Spiophanes berkeleyorum	MG	All	Diagnostic	SCAMIT Vol. 7 (11)
Spiophanes bombyx	MG	L. Harris	Diagnostic	Illustration
Spiophanes fimbriata	MG	All	Diagnostic	SCAMIT Vol. 7 (11)
Spiophanes kroyeri	MG	L. Harris	Diagnostic	Illustration
Spiophanes missionensis	MG	All	Diagnostic	SCAMIT Vol. 7(11)/ L. Harris has illust. of type
Spiophanes wigleyi	MG	L. Harris	Diagnostic	Illustration
Family Magelonidae				
Magelona berkeleyi	MG	SD/L. Harris	Diagnostic	SD illustration/ L. Harris illust.
Magelona californica	MG	L. Harris	Diagnostic	Illustration of type
Magelona hartmanae	MG	L. Harris	Diagnostic	Illustration of type
Magelona pitelkai	MG	L. Harris	Diagnostic	Illustration of type
Magelona pitelkai	RB	L. Lovell	Diagnostic	none
Magelona sacculata	MG	SD/L. Harris	Diagnostic	SD illust./ L. Harris has illust. of type
Magelona sacculata	RB	SF	Diagnostic	Kathy Langan has illustration
Magelona sp. A	MG	SD	Diagnostic	SD in-house voucher sheet
Family Poecilochaetidae	AB	SD	Highlight	none
Family Heterspionidae				
Heterospio catalinensis	MG	L. Harris	Diagnostic	Illustration of type
Family Chaetopteridae	MG	SD	unsuccessful	

POLYCHAETE STAINING PATTERN USE

Species Name	Type of Stain [1]	Lab or Person [2]	Purpose [3]	Illustration/ Documentation [4]
Family Cirratulidae				
Aphelochaeta marioni	MG	All	Diagnostic	SCAMIT Vol. 14 (1)
Aphelochaeta monilaris	MG	All	Diagnostic	SCAMIT Vol. 14 (1)
Aphelochaeta multifilis (Type II Blake)	MG	All	Diagnostic	T. Phillips has voucher sheet
Aphelochaeta sp. 1	MG	All	Diagnostic	SCAMIT Vol. 14 (1)
Aphelochaeta sp. C	MG	All	Diagnostic	SCAMIT Vol. 14(1)
Monticellina dorsobranchialis	MG	All	Diagnostic	T. Phillips has voucher sheet
Monticellina tesselata	MG	All	Diagnostic	T. Phillips has voucher sheet
Monticellina sp. HYP 1	MG	All	Diagnostic	T. Phillips has voucher sheet
Monticellina sp. HYP 2	MG	All	Diagnostic	T. Phillips has voucher sheet
Monticellina sp. 1 (Lovell & Phillips)	MG	Lovell/Phillips	Diagnostic	voucher sheet
Protocirrineris sp. A	MG	All	Diagnostic	SCAMIT Vol. 14 (1)
Protocirrineris sp. B	MG	All	Diagnostic	SCAMIT Vol. 14 (1)
Family Capitellidae				
Decamastus gracilis	MG	SD/L. Lovell	Diagnostic	SD illustration
Decamastus gracilis	MG	L. Harris	Diagnostic	Illustration of type
Dodecaseta oraria	MG	L. Harris	Diagnostic	Illustration of type
Heteromastus filiformis	MG	SD/L. Harris	Diagnostic	SCAMIT Vol. 3 (11)
Heteromastus filobranchus	MG	SD/L. Harris	Diagnostic	SCAMIT Vol. 3 (11)
Mediomastus acutus	MG	L. Harris	Diagnostic	Illustration of type
Mediomastus ambiseta	MG	L. Harris	Diagnostic	Illustration of type
Mediomastus californiensis	MG	L. Harris	Diagnostic	Illustration of type
Notomastus latericeus	MG	SD/HYP/Harris	Diagnostic	SD in-house voucher sheet & T. Phillips & L. Harris have illustrations
Notomastus lineatus	MG	HYP/Harris/Lovell	Diagnostic	T. Phillips & L. Harris have illustrations
Notomastus magnus	MG	SD/L. Harris	Diagnostic	SD in-house voucher sheet & L. Harris has illustration of type
Notomastus tenuis	MG	All	Diagnostic for generic separation	SCAMIT Vol. 3 (11) & L. Harris has illust. of type
Family Maldanidae				
Axiothella rubrocincta	MG	L. Harris	Diagnostic	Illustration of type
Axiothella rubrocincta	MG	All	Diagnostic	SCAMIT Vol. 6 (5)
Clymenella complanata	MG	All	Diagnostic	R. Rowe has illust./L. Harris has illust. of type
Clymenella sp. A	MG	All	Diagnostic	L. Harris has illustration
Clymenopsis californiensis	MG	L. Harris	Diagnostic	Illustration of type
Clymenura gracilis	MG	All	Diagnostic	L. Harris has illust. of type/SD illust.
Clymenura gracilis	MB	T. Parker	same as MG pattern	none
Euclymene campanula	MG	L. Harris	Diagnostic	Illustration of type
Euclymene delineata	MG	L. Harris	Diagnostic	Illustration of type
"Euclymene grossa newporti"	MG	All	Diagnostic	L. Harris has illust. of type/SD illust.
Euclymeninae sp. A	MG	All	Diagnostic	SCAMIT Vol. 6 (5)
Euclymeninae sp. A	MB	T. Parker	same as MG pattern	none
Isocirrus longiceps	MG	L. Harris	Diagnostic	Illustration of type
Maldane sarsi	MG	L. Lovell	Highlight	none
Notoproctus pacificus	MG	L. Harris	Diagnostic	Illustration
Praxillella gracilis	MG	L. Harris	Diagnostic	see table in SCAMIT Vol. 13 (10)
Praxillella pacifica	MG	L. Harris	Diagnostic	see table in SCAMIT Vol. 13 (10)
Praxillella pacifica	MB	T. Parker	Diagnostic	written observations
Rhodine bitorquata	MG	R. Rowe	Diagnostic	R. Rowe has illustration
Family Opheliidae	MG	SD	unsuccessful	
Family Phyllodocidae	MG/AB	All	Highlights structures for small animals	none

POLYCHAETE STAINING PATTERN USE

Species Name	Type of Stain [1]	Lab or Person [2]	Purpose [3]	Illustration/ Documentation [4]
Family Hesionidae	MG/AB	All	Highlights structures for small animals	none
Family Syllidae				
Exogone spp.	AB/MG	All	Highlight	none
Sphaerosyllis spp.	AB/MG	All	Highlight	none
Family Glyceridae	AB	SD	Highlight	none
Family Nephtyidae	MG	All	Highlights brain and small animals	none
	AB	SD	Highlight interramal cirri also	none
Family Sphaerodoridae	AB	SD	Highlight	none
Family Onuphidae				
Diopatra ornata	MG	L. Harris	Diagnostic	Illustration
Diopatra splendidissima	MG	L. Harris	Diagnostic	Illustration
Diopatra tridentata	MG	L. Harris	Diagnostic	Illustration
Family Dorvilleidae	AB	SD	Highlight prostomial structures	none
Family Owenidae				
Owenia collaris	MG	L. Harris	Diagnostic	Illustration of type
Family Ampharetidae	MG/AB	All	Highlight especially small animals	none
Amage anops	MG	L. Harris	Diagnostic	Illustration
Ampharete acutifrons	MG	All	Highlight	none
Ampharete acutifrons	MG	L. Harris	Diagnostic	Illustration
Ampharete arctica	MG	All	Highlight	none
Ampharete arctica	MG	L. Harris	Diagnostic	Illustration
Ampharete labrops	MG	All	Highlight	none
Ampharete labrops	MG	L. Harris	Diagnostic	Illustration of type
Ampharetidae sp. SD 1	MG	SD	Highlight	none
Amphicteis glabra	MG	All	Highlight	none
Amphicteis mucronata	MG	All	Highlight	none
Amphicteis scaphobranchiata	MG	All	Highlight	none
Anobothrus gracilis	AB/MG	SD/LAC/Lovell	Highlight	none
Anobothrus gracilis	MG	L. Harris	Diagnostic	Illustration
Asabellides lineata	MG	L. Harris	Diagnostic	Illustration
Eclysippe trilobatus	MG	L. Harris	Diagnostic	Illustration of type
Lysippe sp. A	MG	All	Diagnostic	SCAMIT Vol. 4 (8)
Lysippe sp. B	MG	All	Diagnostic	SCAMIT Vol. 4 (8)
Melinna heterodonta	MG	L. Harris	Diagnostic	Illustration
Melinna oculata	MG	L. Harris	Diagnostic	Illustration of type
Mooresamytha bioculata	MG	L. Harris	Diagnostic	Illustration
Sabellides sp.	MG	L. Lovell	Diagnostic	none
Samytha californiensis	MG	L. Harris	Diagnostic	Illustration
Schistocomus hiltoni	MG	All	Diagnostic	SCAMIT Vol. 6 (5)
Schistocomus sp. A	MG	All	Diagnostic	SCAMIT Vol. 6 (5)
Sosane occidentalis	MG	L. Harris	Diagnostic	Illustration of type
Sosanopsis sp. A	MG	L. Harris	Diagnostic	Illustration

POLYCHAETE STAINING PATTERN USE

Species Name	Type of Stain [1]	Lab or Person [2]	Purpose [3]	Illustration/ Documentation [4]
Family Terebellidae				
Eupolymnia heterobranchia	MG	SD/Lovell	Diagnostic	SD illustration
Lanassa gracilis	MG	SD/Harris/Lovell	Diagnostic	SD illust./L. Harris illust.
Lanassa venustavenusta	MG	SD/Harris/Lovell	Diagnostic	SD illust./L. Harris illust.
Lanassa sp. D	MG	SD/Harris/Lovell	Diagnostic	SD illust./L. Harris illust.
Lanice conchilega	MG	SD/Harris/Lovell	Diagnostic	SD illust./L. Harris illust.
Pista alata	MG	All	Diagnostic	SCAMIT Vol. 4 (11) & L. Harris has illust. of type
Pista brevibranchiata	MG	L. Harris	Diagnostic	Illustration of type
Pista elongata	MG	L. Harris	Diagnostic	Illustration of type
Pista fasciata	MG	All	Diagnostic	as P. disjuncta in SCAMIT Vol. 4 (11)
Pista moorei	MG	All	Diagnostic	SD description
Pista sp. B	MG	All	Diagnostic	SCAMIT Vol. 4 (11)
Polycirrus californicus	MG	All	Diagnostic	SCAMIT Vol. 14 (1)
Polycirrus sp. I	MG	All	Diagnostic	SCAMIT Vol. 13 (12) also R. Rowe illust.
Polycirrus sp. III	MG	All	Diagnostic	Banse 1980
Polycirrus sp. V	MG	All	Diagnostic	SCAMIT Vol. 13 (12) also R. Rowe illust.
Polycirrus sp. A	MG	All	Diagnostic	SCAMIT Vol. 13 (12)
Proclea sp. A	MG	SD	Diagnostic	SD illustration
Spinosphaera oculata	MG	L. Harris	Diagnostic	Illustration
Streblosoma crassibranchia	MG	All	Diagnostic	SCAMIT Vol. 4 (11) & L. Harris has illustration
Streblosoma sp. B	MG	All	Diagnostic	SCAMIT Vol. 4 (11) & L. Harris has illustration
Family Trichobranchidae				
Artacamella hancocki	MG	L. Harris	Diagnostic	Illustration of type
Terebellides spp.	MG	All	Not diagnostic for species level ident.	Williams 1984
Family Sabellidae				
Bispira spp.	MG	L. Harris	Diagnostic	Illustration
Chone albocincta	MG	All	Diagnostic	SCAMIT Vol. 5 (3)/Banse 1972 & L. Harris has illust. of type
Chone minuta	MG	All	Diagnostic	SCAMIT Vol. 5 (3)/Banse 1972 & L. Harris has illust. of type
Chone mollis	MG	All	Diagnostic	Banse 1972/ L. Harris has illust.
Chone veleronis	MG	All	Diagnostic	SCAMIT Vol. 5 (3)/Banse 1972 & L. Harris has illust. of type
Chone sp. B	MG	All	Diagnostic	SD illust./ L. Harris has illust.
Chone sp. C	MG	All	Diagnostic	SD illust./ L. Harris has illust.
Euchone arenae	MG	SD/ L. Harris	Diagnostic	SD illustration/Banse 1970 & L. Harris has illust. of type
Euchone hancocki	MG	SD/ L. Harris	Diagnostic	SD illustration/Banse 1970 & L. Harris has illust. of type
Euchone incolor	MG	SD/ L. Harris	Diagnostic	SD illustration/Banse 1970 & L. Harris has illust. of type
Euchone limnicola	MG	All	Highlight	L. Harris has illustration
Euchone velifera	MG	All	Diagnostic	Banse 1972/ L. Harris has illust. of type
Fabrisabella sp. A	MG	All	Diagnostic	as Jasmineira sp. A in SCAMIT Vol. 5 (6)
Jasmineira sp. B	MG	All	Diagnostic	L. Harris has illustration
Megalomma pigmentum	MG	D. Vilas/L. Harris	Diagnostic	L. Harris has illustration

POLYCHAETE STAINING PATTERN USE

Species Name	Type of Stain [1]	Lab or Person [2]	Purpose [3]	Illustration/ Documentation [4]
Family Sabellidae (con't)				
Megalomma splendida	MG	L. Harris	Diagnostic	Illustration
Potamethus sp. A	MG	All	Diagnostic	SCAMIT Vol. 5 (6)/L. Harris has illustration
Pseudopotamilla occelata	MG	L. Harris	Diagnostic	Illustration
Pseudopotamilla socialis	MG	L. Harris	Diagnostic	Illustration of type
Pseudopotamilla sp. 1	MG/MB	T. Phillips	Diagnostic	see T. Phillips
Class Oligochaeta	BC	T. Parker	Highlights internal organs	see T. Parker

1. AB– Alcian Blue
   BC– Borax Carmine
   MG– Methylene Green
   MB– Methylene Blue
   RB– Rose Bengal

2. This column refers to the individual lab or person that has used this particular stain on this species.
   The term "All" refers to a regular use by many SCAMIT members.
   HYP– Hyperion, LAC– LA County, SD– City of San Diego, SF– City of San Francisco

3. This column refers to the purpose of the stain; to highlight body structures for ease in viewing or as a diagnostic pattern.

4. This column provides a reference(s) for the stain pattern. This may be either a literature citation, SCAMIT voucher sheet (in which case, the SCAMIT newsletter volume is given), or it may be a member's personal illustration or observation.

A COLORFUL PRIMER

The process of imparting color to preserved tissues is founded upon a large body of chemical research. A number of factors have been shown to influence the results of staining. The short review below includes some of these factors. Recommendations are offered to aid in standardization of staining practice. Use of repeatable methods should increase the value of staining in identification and taxonomy, both within and between laboratories.

A stain or dye creates differences in light wavelengths coming from an object. A dye's molecule must both attach to and impart color to biological tissue. It is the protein components of the tissue and cells that react with the dye. Staining during polychaete identification is used to highlight delicate surface structures such as cilia bands, papillae, branchial scars, parapodial lobes, nuchal organs, and other morphological features. Some species exhibit discreetly staining body regions termed "patterns". These patterns are either on tissue appearing as typical dermal tissue or on "glandular" tissue. Such patterns are sometimes afforded taxonomic significance. SCAMIT Newsletter, May 1995, provides a table of recent literature where staining is reported and also the author's opinion about the taxonomic utility of their staining results. Considerable difference exists between these author's opinions.

Most of the staining by local workers has been done without any standardized written procedures. No specific formulations, treatments, etc. have been followed. Factors known to influence dye/tissue interactions are not addressed within this practice. Each worker has developed their own general guidelines for staining polychaetes. Consequently results from staining will vary. Methylene blue, methyl green, and alcian blue are reported locally as stains of choice. The rationale for choosing these stains seems based upon the dye's convenient availability in the laboratory, its ease of use, or recommendation(e.g."I use methylene blue mixed in ETOH"). Alcian blue was apparently chosen because it remains fairly permanent in tissues of preserved material. Other stains have not been investigated.

Most histological dyes are classified as basic or acidic. A basic dye will stain tissues containing acidic proteins, while acidic dyes will stain tissues with basic proteins. Basic dyes typically stain cytoplasmic components and include the dyes crystal violet, malachite green, methyl green, methylene blue, and thionine. Acidic dyes typically stain nuclear components and include the dyes aniline blue, congo red, methyl blue, orange g, and phloxine. Some dyes are also classified as metachromatic. These have the property of staining different tissues in ranges of colors or hues different from the dye itself. These dyes include basic fuschin, crystal violet, methylene blue, and thionine. The effects of alcohol solutions on metachromatic dyes are complex. In some conditions mucopolysaccharides and nucleic acids may produce metachromatic responses with alcohol solutions; while in other conditions, such response may be suppressed with alcohol.

Some chemicals act as mordants that show affinity both for the dye molecule and the tissue and thus improve stain uptake or retention. Additionally, some substances are chemically

unlike mordants and are classified as accentuators. Accentuators do not combine with the dyed tissue, but enhance the dye coloration of tissue. Basic accentuators include bicarbonate, sodium borate(commonly used as a formaldehyde fixative buffer), and sodium hydroxide. Acid accentuators are phenol, sulfuric acid, and acetic acid.

Staining may be done regressively or progressively. Regressive staining involves over-staining tissue followed by destaining. Progressive staining methods contain no destaining step and dye uptake is due only to selective affinity of the dye for different tissues. This typically involves weak dye solutions or short staining times. Regressive staining is commonly used in polychaete staining, though progressive staining has been used when the most delicate surface features are inspected.

The pH of a dye solution controls the interactions between tissues and dyes. A basic dye's binding is inhibited at lower solution pH levels. Acidic dyes bind to tissues best at low pH but are prevented from binding at higher pH levels. Such chemical curves for pH modulated staining can be created for specific stains and tissue components within a range of pH values. At some pH levels protein will not stain although dye concentrations are high and immersion times are long. The optimal dye uptake of methylene blue occurs at pH 7.0-8.0. Acidic dyes such as aniline blue reach optimal uptake at pH 2.0-3.0. Please note that the acid/base relationship between tissues and dyes is a separate reaction influenced by pH levels of the dye solution.

A dose/response relationship is generally assumed in which high concentrations of dye solution will stain tissues darker, more deeply, and quicker than low concentrations. This is, however, limited by availability of tissue sites for dye binding. Surface tissue protein sites fill to capacity in the presence of dye surplus. Subsequent staining in other sites and tissues is greatly influenced by the time available for further penetration. This penetration occurs at a greatly reduced rate. Influences to this rate of staining vary between tissue regions based on the density of charges in each region. Other mechanical and chemical factors have been shown to influence the rate of staining.

There are several less recognized factors acting upon dye uptake. Fixation method influences dye uptake. Formaldehyde fixation greatly increases basic dye uptake. Ionic or dissolved salt concentrations will also affect dye interactions. Increasing ionic strength of the solution will decrease staining in both basic and acid dyes. Dyes will diffuse into tissues at different rates under differing temperatures. Typically staining rate increases with temperature. Dye powders with the same product name are often various chemical formulations of dye. These differences are rarely represented on the manufacturer's bottle. Dyes named polychrome methylene blue, methylene blue, or alcian blue 8GX, alcian blue 7GX, and alcian blue GS are all different dyes. Failure to control the numerous staining conditions will result in a variety of dye uptake results.

Polychaete body function is based upon segmentation. Some body segments are dedicated to specific functions(e.g. branchia formation, tentacle growth, specialized setae). Some of these functions require specialized organization of the nervous system or other physiological components. However all such specialization is not a permanent feature of

life history (e.g. gonad formation and reproduction are temporary events). Differential stain affinity in polychaete tissue is a reflection of a segment's specialized tissues. Examples of strong dye uptake by branchia, nephridia, or the margins of parapodia are commonly assumed to represent such organization. Other staining patterns however, seem to have no easily discerned underlying structural component. "Racing stripes" on maldanids, dye affinity for margins of segments, and fine discrete speckling on many dermal surfaces (often in their own delicate patterns) are not currently known to be associated with a particular segment function or tissue organization. Standardization of staining methods must be relied upon to control variability. This will reduce confusion from differences between observable morphology and staining patterns.

RECOMMENDATIONS

Establish a standardized and written protocol for staining methods

Include dye formulation, stain solution formulation, method of application, length of uptake and destain steps. This should be written in a format and style that will allow any worker to reliably duplicate these methods at some later date. Any specific time horizons for mixing, staining, destaining should be specified. The use of a single dye and formulation for all workers will help reduce differences in stain results. If this is not possible, document each dye's stain reaction.

Document your results

Detailed written, drawn, or photographed representations of stain patterns, intensity, speckling, fading, etc. should be made for each taxa stained and identified. Make special note to determine if there are any variations in stain within a species from the same sample, as opposed to differences between individuals of one species in different samples. Please note that stain intensity and color may be influenced by physical or chemical conditions and metachromatic dye properties (e.g. methylene blue).

Use stains

to contrast and highlight important anatomical features that are referenced in the literature. Branchial counts, parapodial shape, buccal lips, cirri form, tentacle insertion, and segmental lines, and nuchal organs are all examples of structures enhanced by the use of stains. Dye uptake by polychaete tissue has been casually described as typical of glandular tissue or mucopolysaccharides. Dye affinity for specific glands or glandular tissue is not well documented in polychaetes. Specific affinity for mucopolysaccharides or some other proteinaceous material has not been demonstrated in polychaetes. Changes in a dye's affinity for tissues modified during ontogenic or reproductive events have not been widely investigated and reported. Consequently the formation of stain patterns on polychaete body walls may not represent species level taxonomic characters.

Cautiously use

observed new or unpublished staining patterns to confirm a species concept. This caution is due in part to the currently non-standardized techniques in use. Detailed descriptions of staining patterns for only a few species have been published. This makes it more difficult to tie-in stain results to the known taxonomic record. Until staining procedures are standardized and detailed documentation of results are distributed, workers should realize that results will be highly subjective and potentially inconsistent.

Do not identify

new taxa based fundamentally upon staining patterns. An understanding of stain/tissue interaction based on control of procedural variables, reproducible results, comparison to taxonomic type material, and cross comparison to related species has not been established.

PRACTICAL CONSIDERATIONS

Recommended dye: methylene blue

Formulation: methylene blue (C. I. 52015)_____3.0 g
(see Humason) absolute ETOH_____30.0 ml
KOH, 0.01% aqueous_____100.0 ml (best for pH 5.5-8.0)

Storage: stoppered, room temperature

Applications: Regressive staining: Record timed steps of staining and destaining.
Progressive staining: Record time of stain step

Specimen fixation: Buffered formaldehyde

I have tested this formulation upon *Chone* and euclymenid polychaetes. It is a very concentrated solution which imparts dark blue and purplish stain to the dermis of the specimens in the first 1-5 seconds. Immediate rinsing in 70% ETOH reveals a delicate and discrete series of stain dots that highlight the surface and associated structures. Staining of *Chone* for 10-20 seconds over stains the animal and leaves a nearly blackened specimen with little differentiation except at the segmental lines and setal fascicles. Destaining progresses most rapidly in the briefly stained specimen. I have also used this stain solution as a stock to make a more dilute working solution. It is based on the formulation:

10 ml stock dye solution
30 ml DI water
10 ml ETOH(abs)
Mix and store stoppered.

INFORMAL OBSERVATIONS:

This solution produces delicate and light stains on the surface when dipped for a few seconds. These stains become very dark when left in solution for up to 1 minute.

....*Chone:*

This stain seemed to rapidly penetrate *Chone* branchial structures and show the internal compartment membranes clearly. Stain patterns typical for *Chone mollis* are seen with this formulation

....*Sosane:*

Quick dipping of *Sosane* specimens revealed delicate surface structures, while longer immersion (20 seconds) produced deeply stained patterns of tissue on the ventrum.

....*Mediomastus:*

Staining less than 5 seconds for *Mediomastus* produced a metachromatic purplish dot pattern on the posterior thoracic segments and discrete blue speckles on other segments. Staining this specimen for 1 minute produced an intense dark blue body pigmentation. Destaining over 3-5 minutes produced a light background in the abdomen and dark thoracic stains most intense on setigers 6-9.

....*Aphelochaeta marioni:*

was stained for 45 seconds and developed a dark blue stain. When regressively stained, it revealed the typical ventral staining pattern in less than 30 minutes. Some experimentation with dye solution concentration, stain time, and destaining may greatly reduce the effort needed to process large numbers of cirratulid specimens.

....*Clymenura gracilis*:

specimens revealed several hues of stain. On anterior segments #4-8, the segments were partially stained with a generalized light green diffuse color overlaid with small discrete spots of dark blue; the other portion of these segments were differentiated by a speckling of reddish-purple pigment spots. The darkly stained shield on setiger 8 was clearly stained with a purplish blue collection of delicate dots.

....*Myriochele* :

specimens stained in this solution bore discrete speckling on the lateral thorax and lower margin of the buccal region.

....*Praxillella pacifica:*

specimens reveal a metachromatic response on setigers 4-7. The general background coloration is a greenish blue, while setigers 4-7 have a purplish blue tone.

....*Lanice conchilega*:

blue and bright purple stain patterns were apparent in *Lanice*. There was a purple stain pattern along the thoracic parapodia resulting in a stripe.

.... *Euclymeninae sp. A*:

the racing stripes seen on the abdomen of *Euclymeninae sp. A* were apparent when stained with this solution, but appeared as an accumulation of discrete dots lined up as stripes down the body wall.

Though metachromatic stain reactions are not currently afforded taxonomic significance, they do provide another level of visual differentiation for the observer. It may be that metachromatic reactions are associated with specific tissue structures or functions different from surrounding tissues. Given that this methylene blue formulation produces color with both diffused coloration and delicate discrete spots, and that metachromatic responses are organized in localized patterns, I recommend this stain solution as a superior technique for observing whole body polychaetes for routine identification and associated taxonomic work. The appearance of specimens stained in this dye is superior to the features seen for similar specimens stained in various 70% ETOH solutions of methylene green powder.

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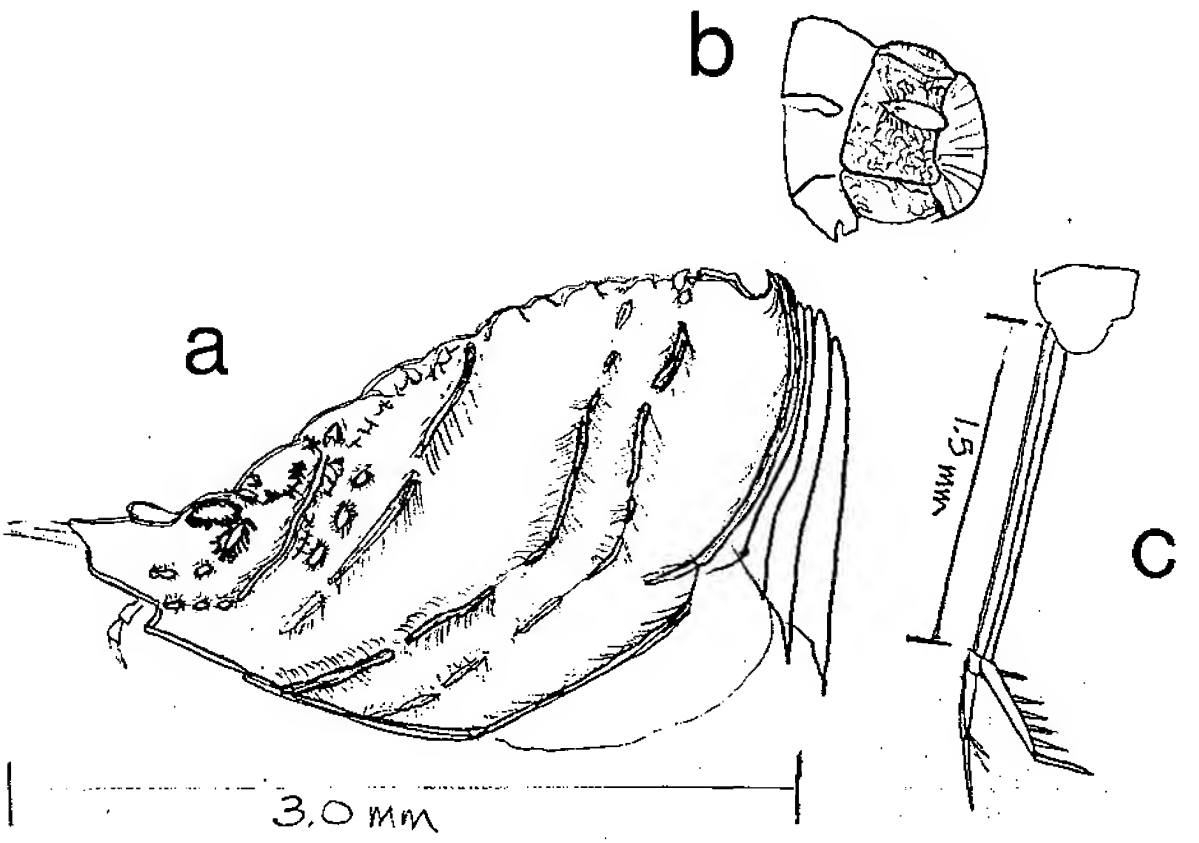
DEPTH RANGE: 150 - 307 m

DISTRIBUTION: San Pedro Sea Shelf, off Los Angeles County

COMMENTS: This species is usually found in relict red sands and/or coarse shelf break sediments. It's characteristic red-orange pigmentation may derive from the ferrous minerals which are found there. There are dark-purplish pigment spots on the anterodorsal portion of the carapace in mature specimens. The peculiar square uropodal peduncles are immediately diagnostic for this species, even in smaller individuals. The pattern of fragmentation of the ridges is individual, each specimen having different breaks and separations into ridge segments and pustules.



Campylaspis sp A a) carapace of adult female, b) last abdominal segment of adult female showing positions and relative size of the teeth, c) uropod of adult female (specimen from 307m, Station BD2-4-III, 7 March 1984; LA2 Dump Site off Los Angeles Harbor)

4. Differs from *Diaphana californica* in lacking a prominent globose nuclear whorl, in having a broadly open aperture, in having a globose rather than barrel-like shell, and in having a minute rather than prominent umbilicus

5. Differs from *Parvaplustrum sp A* in being globose, not pyriform; and in lacking a spoutlike posterior carina circling an involute spire

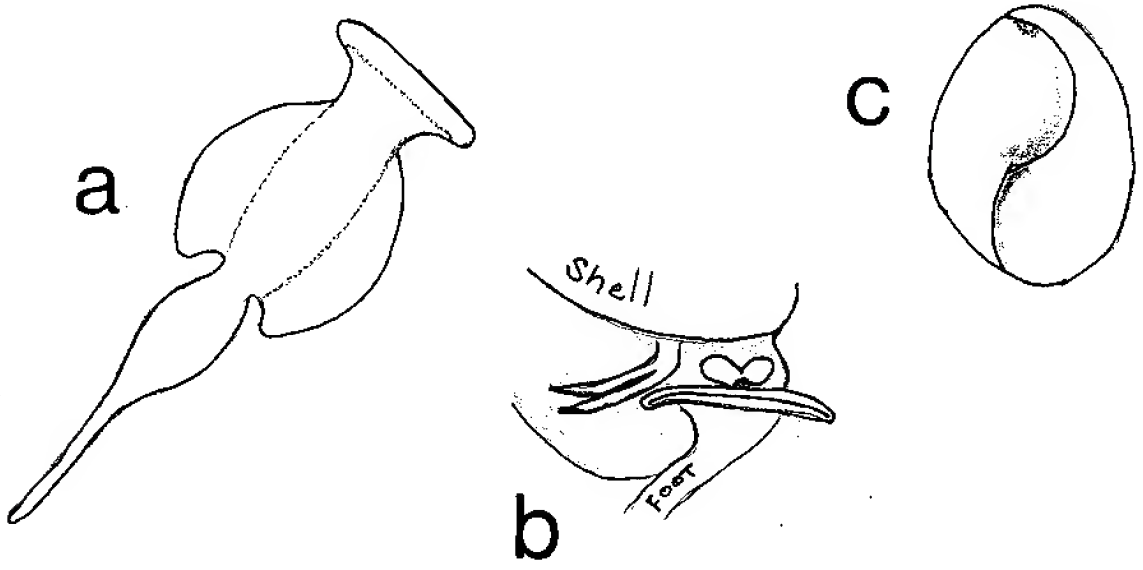
6. Differs from Bullomorpha sp A in being globose rather than barrel-like, in having only a minute spire perforation rather than a sunken pit; and in having a thin transparent shell rather than a thicker opaque white shell (small thinner Bullomorpha sp A show a black mantle ocellus lacking in *Meloscaphander sp A*)

7. Differs from *Woodbridgea polystrigma* in lacking spiral lines of punctae on the shell, and in being more globose

DEPTH RANGE: 30 - 605m

DISTRIBUTION: San Diego to Goleta

COMMENTS: Generic placement of the present taxon is open to question. The genus *Meloscaphander*, while similar in external morphology to the present species, contains only species from the Banda Sea (Schepman 1913) or from the abyssal North Atlantic (Bouchet 1975). Until a thorough investigation of the internal anatomy of the present species is completed placement in *Meloscaphander* is tentative. The bifid tentacles of this species are similar to those of *Parvaplustrum sp A*, and it is possible that this taxon also belongs in *Parvaplustrum*.



Meloscaphander sp A a) ventral view of foot and parapodia; b) anterior oblique view of animal showing auriform oral tentacles, bilabiate anterior foot margin, and bifid tentacles; 3) apertural view of shell (drawn from a 3mm long specimen taken in 305m off Palos Verdes [Station 1A - January 1991]).

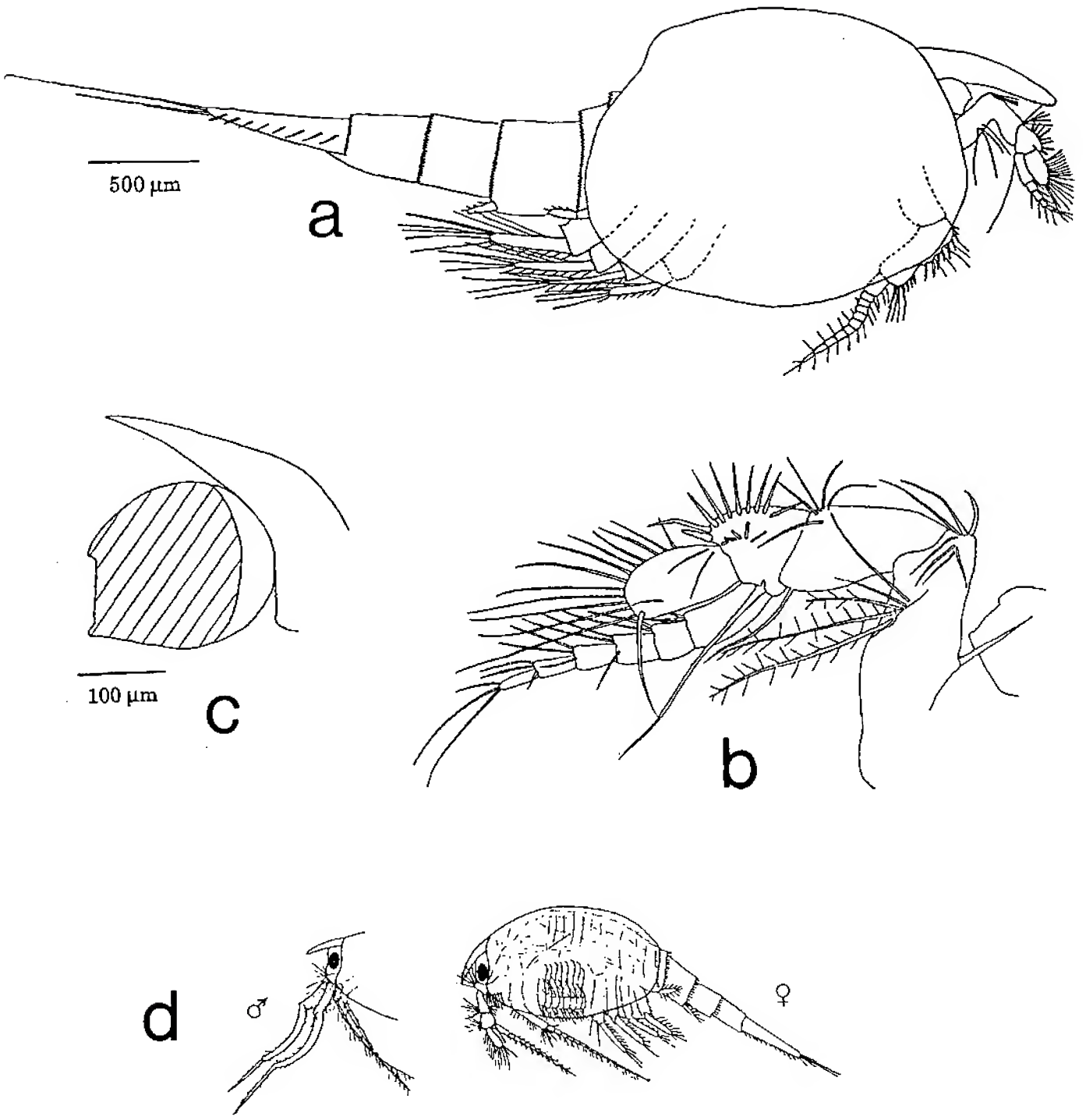


Figure 1a.) *Nebalia sp A*: lateral view of a ♀; 1b.) Antennule of *Nebalia sp A* ♀ (scale as in 1c.); 1c.) eyestalk and supraocular scale of *Nebalia sp A* ♀; 1d.) ♂ and ♀ of *Nebalia cf. pugettensis* (Note geniculate antennular peduncle of ♂ and multiarticulate antennular peduncle of ♀). (1a,b,c from Vetter MS, 1D from Smith and Carlton 1975 [Light's Manual])

COMMENTS: This animal was recently described in greater detail by Wilson (MS) in a draft report on investigations in the Santa Maria Basin in Central California. He was the first to distinguish this species as more than just a form of *Pleurogonium californiense*. Records of *P. californiense* prior to 1992 require reexamination for *P. sp A* as the two co-occur in mixed populations in Central California. *Pleurogonium rubicundum* has also been reported to range into the Southern California Bight, but *P. inerme* has not yet been recorded south of Prince William Sound in the Northeast Pacific. Wilson (MS) indicated that this species may exhibit (at least in some populations) protogynous hermaphroditism.

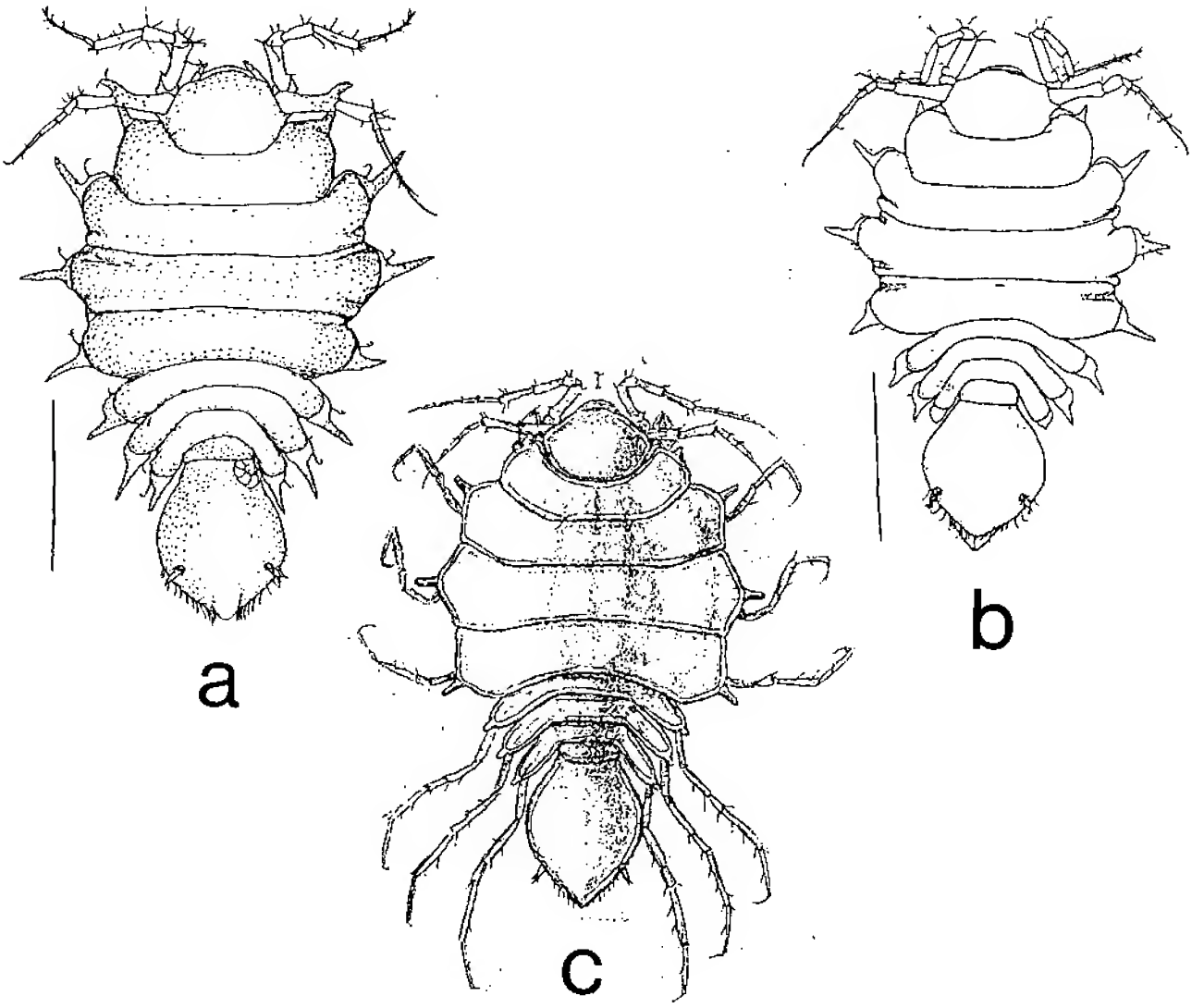


Figure 1. Species of *Pleurogonium* reported from California; A) *Pleurogonium sp A*, B) *Pleurogonium californiense* Menzies 1951, C) *Pleurogonium rubicundum* (Sars 1863)[Figures 1A and 1B from Wilson MS, Figure 1C from Sars 1897][scale bar = 0.5mm]

the involute spire; and in being pyriform not evenly ovate

5. Differs from both *Meloscaphander sp A* and *Bullomorpha sp A* in being pyriform not globose; and in having the posterior carina circling the spire

6. Differs from *Diaphana californica* in having an involute spire, in lacking a large globose nuclear whorl, and in posession of a posterior carina framing a spout-like posterior aperture

DEPTH RANGE: 8 - 200m

DISTRIBUTION: at least San Diego to Puget Sound based on examined material

COMMENTS: Despite their small size, specimens above 1mm in length are reproductively mature. Sectioning has shown both sperm and mature ova in specimens of 1.1 and 1.2mm length. Most specimens are less than 1 mm long, and are lost through a 1mm screen. The shells are very fragile, and often will be completely crushed and lost during collection and processing. The shape of the animal is so distinctively pear-like that even after shell loss identification is easy. The animals are most frequent in areas of fine silt to coarse clay sediments in bays and offshore. The species was allocated to *Parvaplustrum* by Dr Terry Gosliner (Cal. Acad. Sciences). The genus was previously known only from deep water in the south Atlantic (Marcus & Marcus 1969). While provisionally placed in the Hydatinidae, a new family for this genus will almost certainly be required (Gosliner, pers. comm. 1994). Radulae have been recovered, but were lost before they could be mounted. Superficial observations before loss indicated a radular formula of 1-1-1, but this requires verification.

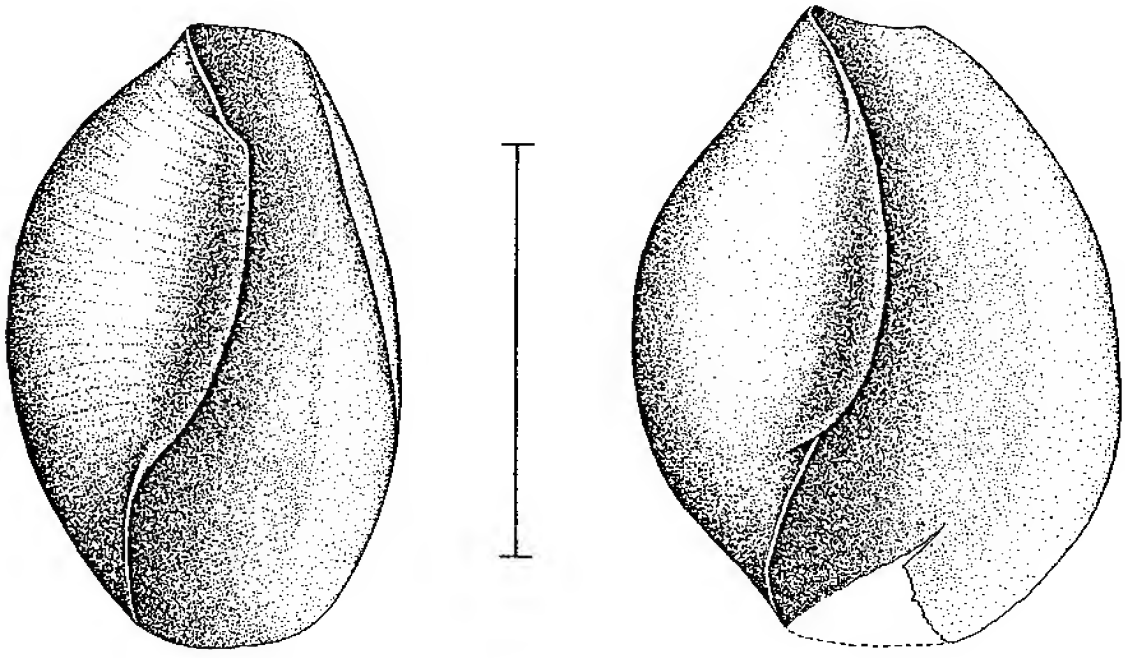


Figure 1. Apertural views of "normal" (showing the rare punctate lines) and "obese" individuals of *Parvaplustrum sp A* (scale bar = 1mm)

COMMENTS: Of the local species of *Cyclaspis* this is most similar to *C. nubila*, resembling it in size, general body shape, and surface texture. Both *Cyclaspis sp B* and *Cyclaspis sp C* are smaller at maturity (about ½ the size). The dentition of the dorsal carapace carina which characterizes this species is unfortunately not invariate. Carinal teeth may be difficult to see on decalcified or recently moulted specimens. During the terminal ♂ moult all dorsal teeth may be lost, and the carina tends to have fewer teeth in larger ♂s. The number of dorsal carinal teeth also varies in ♀s, but even the largest ♀s always have at least one tooth. The species is most common between 11-20m, frequenting fine sand bottoms with or without gravel or shell debris.

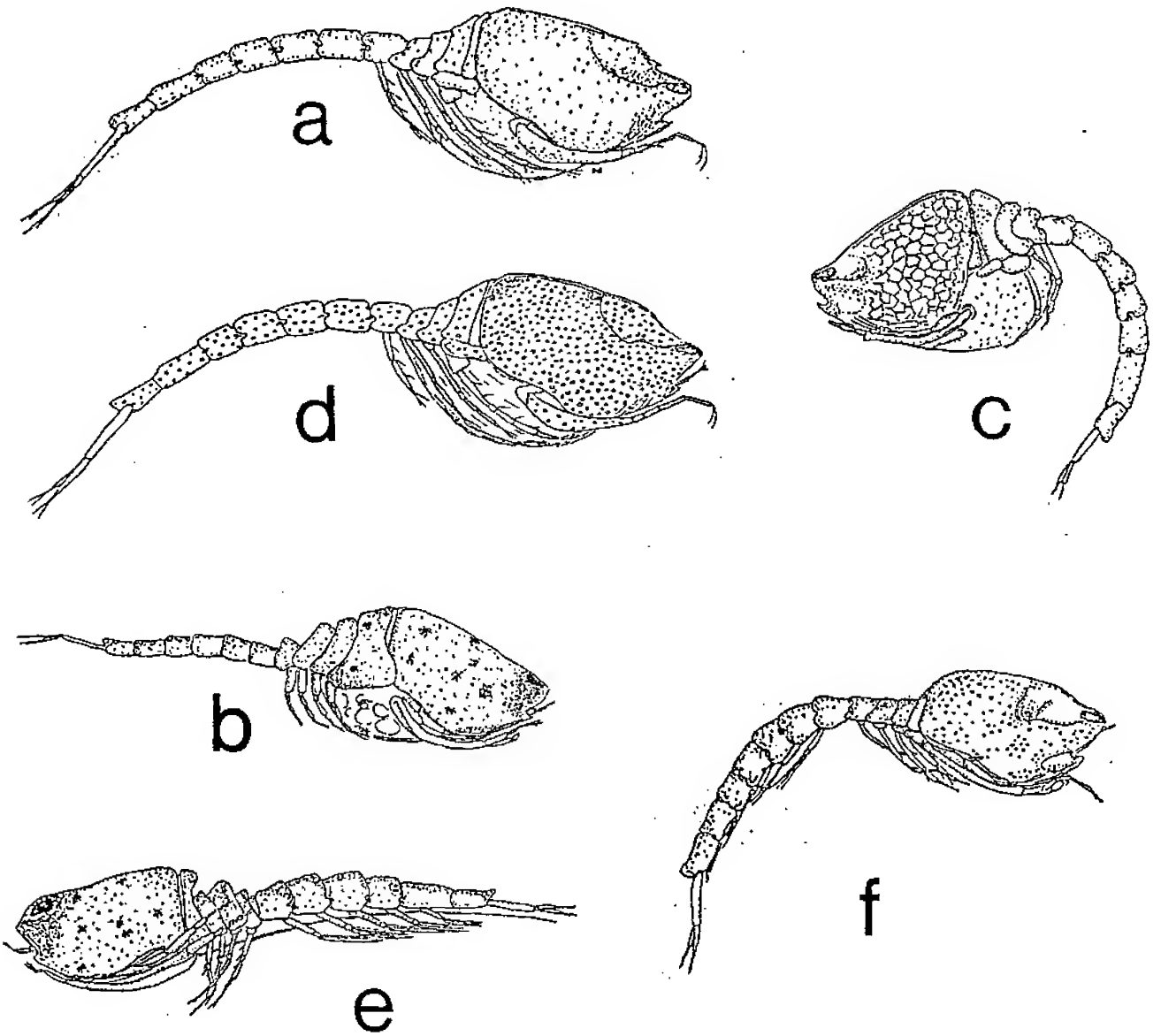


Figure 1 - Lateral views of *Cyclaspis* species from Southern California A) ♀ *C. sp A*, B) ♀ *C. sp B*, C) ♀ *C. sp C*, D) ♀ *C. nubila*, E) ♂ *C. sp B*, F) ♂ *C. sp C*

DEPTH RANGE: 20 - 30m

DISTRIBUTION: off Church Rock, Catalina Island to Palos Verdes Point, Palos Verdes Peninsula

COMMENTS: This was reported from Catalina Island as *A. dolichognatha* by Wicksten 1984. Her specimen lacked legs, and most other characters fell within the bounds of variation of the pantropical *A. dolichognatha* (Banner & Banner 1973). The lack of propodial spinules on the third pereopod of the Palos Verdes specimen separated it immediately from *A. dolichognatha* (Chace 1988). Comparison with *A. dolichognatha* specimens from Mexican waters (Allan Hancock Foundation Collections, identified by Mary Wicksten) showed both Catalina Channel specimens differed in details of the stylocerite, 3rd maxilliped, and telsonic armature from southern specimens. The Catalina and Palos Verdes specimens proved conspecific despite lack of legs on one. The only other species in the genus reported from waters of Baja California which might range into our area during ENSO events (*A. rugosa*) differs considerably in ornamentation of the chelae. The Palos Verdes specimen was translucent cantalope orange throughout the body when alive. Aside from the scarlet/apricot egg mass, the only other color was in two bright scarlet eyespots on top of the carapace. These spots were in roughly the position where eyes would lie in the genus *Alpheus*.

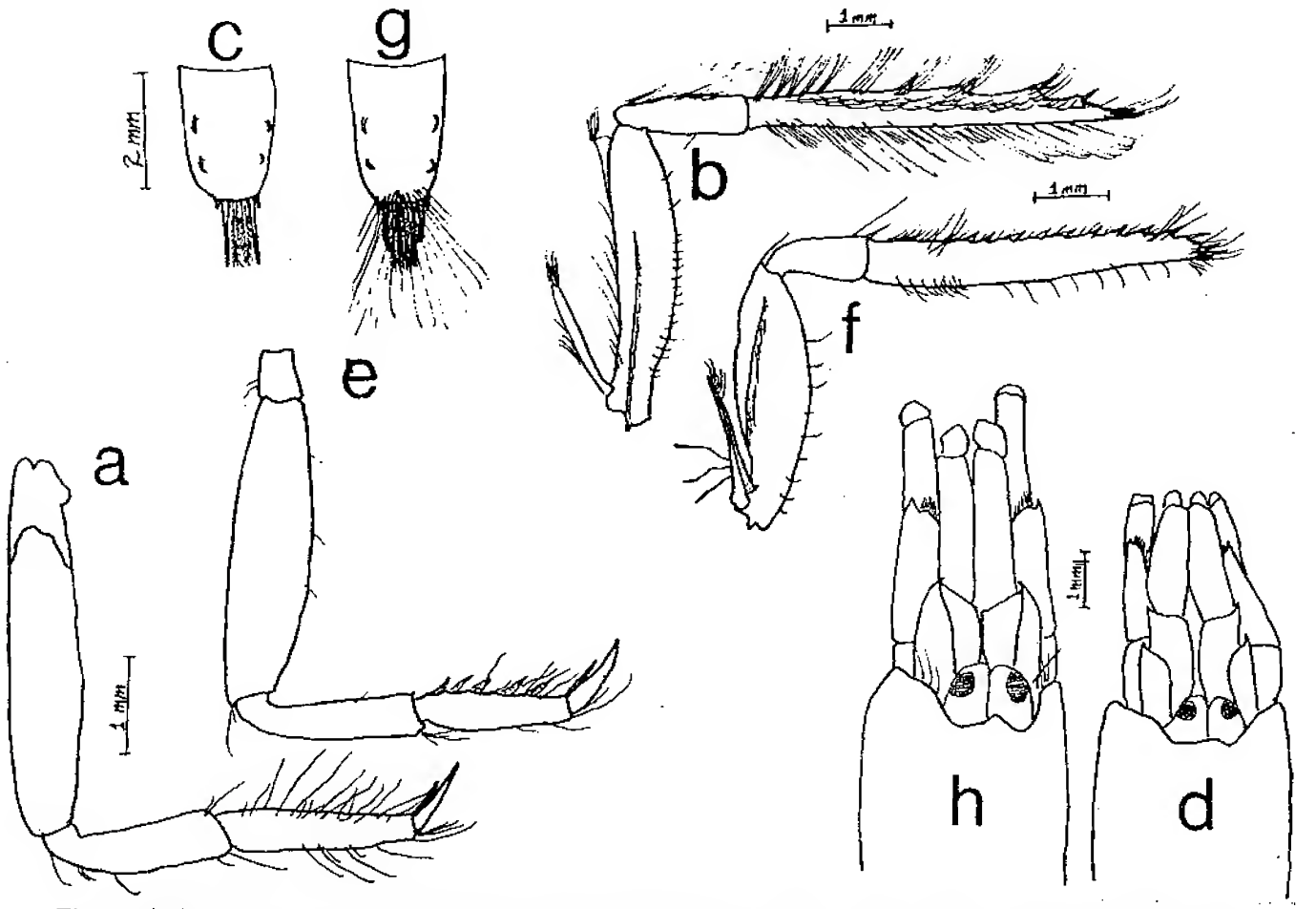


Figure 1)*Automate sp A* a. 3rd leg, b. 3rd maxilliped, c. telson, d. anterior carapace; *Automate dolichognatha* e. 3rd leg, f. 3rd maxilliped, g. telson, h. anterior carapace (a-d 7.3mm CL ♀♀ from Palos Verdes; e, g-h 7.2mm CL ♀♀ from El Bajo Seamount, Gulf of California, Mexico; f 5.2mm CL ♀♀ from Clarion Island, Mexico)

SCAMIT CODE: MBC 17 Date Examined: January 1993
Voucher By: Don Cadien

SYNONYMY: (?) *Procampylaspis sp* Zimmer 1936
Procampylaspis sp A Given 1970
Procampylaspis sp A SCAMIT 1983

LITERATURE: **Given, R. R. 1970.** The Cumacea (Crustacea, Peracarida) of California: systematics, ecology and distribution. Ph.D. Dissertation, Biology, University of Southern California 185pp.
Zimmer, C. 1936. California Crustacea of the order Cumacea. Proceedings of the United States National Museum 83(2992):423-439

DIAGNOSTIC CHARACTERS:

1. entire surface covered by dense adherant brown sandy crust (removable only with difficulty)
2. ventrolateral portion of carapace bearing shallow sulcus on the anterior 2/3
3. ventral pereonite margins bearing flanges ending in fingerlike projections (less evident in ♀)
4. ♂ with row of tubelike spines running parallel to the lower edge of the lateral sulcus; pairs of similar spines dorsally on pereonites 2-5; these spines lacking in ♀ which bears a series of low tubercles above and below the lateral sulcus

RELATED SPECIES AND CHARACTER DIFFERENCES:

Presence of large teeth forming a rake on the dactyl of the second maxilliped serves to separate *Procampylaspis* from *Campylaspis*. Only a single *Procampylaspis* is known from the north east Pacific, so examination for the second maxilliped rake can reliably separate this species from the many co-occurring *Campylaspis* species. This is also the only cumacean known from California which bears an adherant brown sandy crust. Although this crust is occasionally lacking, it's presence will serve to identify well over 95% of *Procampylaspis sp A* specimens.

DEPTH RANGE: 13 - 611m

DISTRIBUTION: Point Loma to at least Point Conception

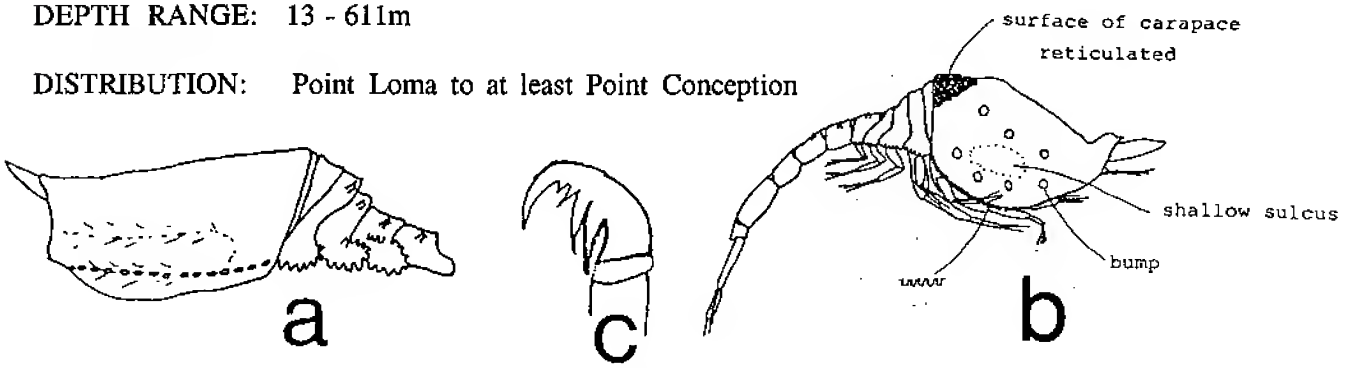


Figure 1. Lateral views of A) ♂, and B) ♀ *Procampylaspis sp A*, C) mxpd 2 dactylar rake
[Figure 1A by C. L. Paquette, Figure 1B by C. A. Phillips, Figure 1C by D. Diener]

SCAMIT CODE: None

Date Examined: January 1993
Voucher By: Don Cadien

SYNONYMY: *Tellina sp A* Ljubenkov 1992
Tellina sp A SCAMIT 1993

LITERATURE: **Carpenter, P. P. 1864**. Supplementary report on the present state of our knowledge with regard to the Mollusca of the West Coast of North America. Report to the British Association for the Advancement of Science for 1863; 517-686
Coan, E. V. 1971. The northwest American Tellinidae. The Veliger 14(Supplement):1-63
Dall, W.H. 1900. Synopsis of the family Tellinidae and of the North American species. Proceedings of the United States National Museum 23(1210):285-326
Palmer, K. v.W. 1958. Type specimens of marine Mollusca described by P. P. Carpenter from the west coast (San Diego to British Columbia). Geological Society of America, Memoir 76:1-376

DIAGNOSTIC CHARACTERS:

1. pronounced sculpture consisting of fine raised concentric ridges, regular and close in juveniles, becoming more widely spaced and fading with growth; nearly or completely lacking in adult (while retained near umbos)

2. shell color variegated pink and yellow in conspicuous and consistant pattern of mid-valve pink wedge surrounded by inverted yellow v

3. internal strengthening rib present, but poorly defined

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. Differs from *Tellina carpenteri* in having fine raised concentric sculpture on the early part of the shell, and in having a central pink wedge/inverted yellow V color pattern instead of a uniform translucent rose color with two thin anterior white rays

2. Differs from *Tellina modesta* in having fine raised concentric sculpture on the early part of the shell which fades with growth, rather than wide flat concentric ridges which become stronger with growth; in being strongly colored rather than transparent to translucent white, in having a much weaker strengthening rib internally; and in having a greater ratio of height to length

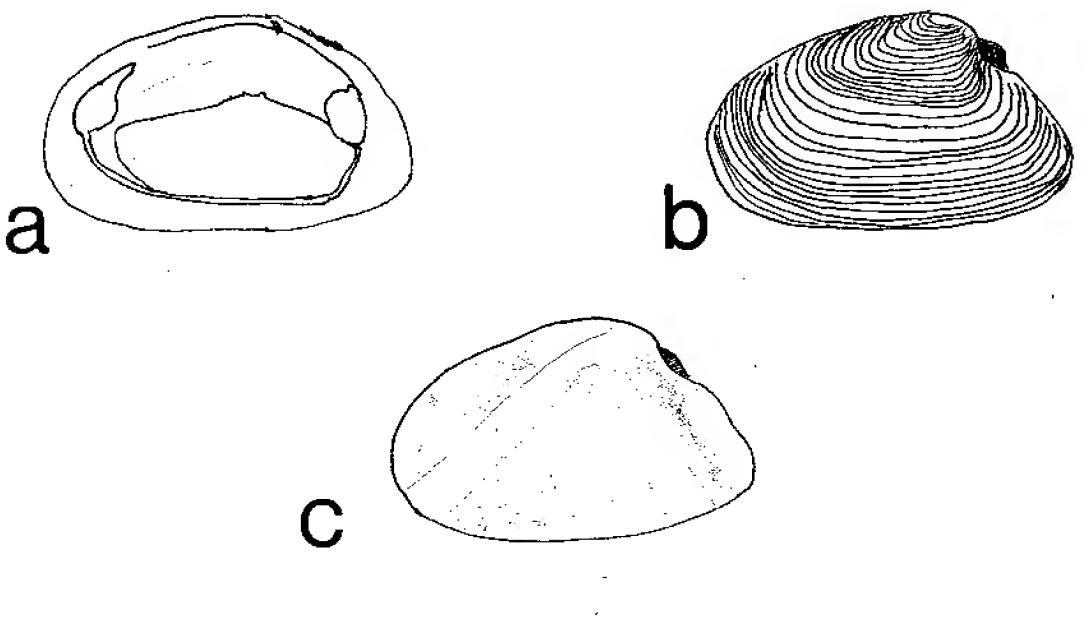
DEPTH RANGE: 60 - 305m (probably also deeper [Coan's 441m for *T. carpenteri*])

DISTRIBUTION: at least Point Loma to Santa Monica Bay, maybe Alaska to Panama since previous records of *T. carpenteri* and *T. sp A* are intermixed

COMMENTS: The history of use of the name *Tellina carpenteri* is clouded. It was originally proposed by Dall (1900) as a replacement name for the preoccupied *Tellina variegata* of Carpenter (1864). It is unclear if reference is being made to the variegated form upon which Carpenter based his 1864 description, or to the solid rose pink form to which it is usually applied in our area. The two often occur together, and it is possible that Carpenter's syntype lot is a mixture of the two forms. Coan (1971) mentions two forms he regards as *T. carpenteri*, one of which I believe to be *T. sp A*. His "large, flat, light-colored offshore one" seems to correspond to the present species, and his "smaller, more inflated, more brightly colored one in bays" is what we call *T. carpenteri*.

Based on bathymetric data collected off Palos Verdes in February 1992 the center of the *T. sp A* population lies deeper than that of *T. carpenteri*. The species occurred at 82% of the stations at 305m, with 72% of the population at this depth. At 150m the species was taken at 55% of the sampled sites, but only 18% of the population occurred at this depth. Declines continued inshore with occurrence at 27% of the 61m sites, where 9% of the population was located. The species was absent at 30m. *Tellina carpenteri* occurred at 64% of the 305m stations, all 150m and 61m stations, and 27% of the 30m stations. Only 5% of the population was located at 305m, with 60% at 150m, 32% at 61m, and 3% at 30m.

Examination of the *Tellina variegata* syntypes may require a reversal of the current usage, with what we currently call *T. sp A* being the true *T. carpenteri*, and the rose pink "carpenteri" requiring a new name. For the moment we will continue with the names as fixed by Ljubenkov in the SCAMIT Newsletter in July 1992.



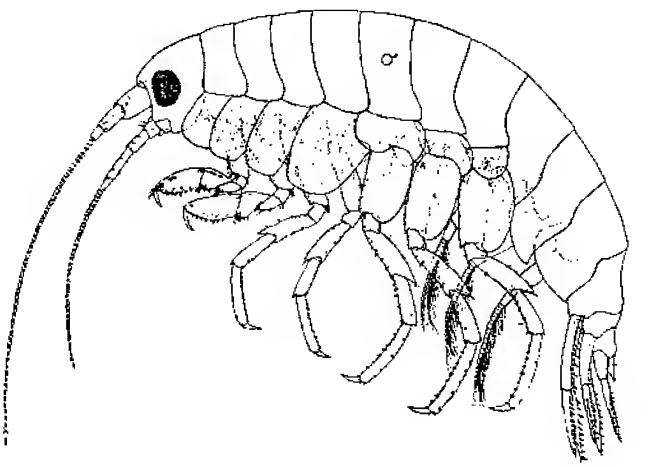
Tellina sp A a) interior of right valve; b) exterior of left valve;
c) color pattern: inverted V pale yellow, other areas orangish pink

November, 1995 SCAMIT Newsletter Vol. 14, No.7

NEXT MEETING:	Amphipods and Octopods
GUEST SPEAKER:	Megan Lilly from CSDMWWD on Octopods
DATE:	December 11, 1995
TIME:	9:30am - 3:30pm
LOCATION:	To Be Announced

DECEMBER 11th MEETING

This meeting will focus on amphipods from the families Pleustidae and Phoxocephalidae, especially the species, *Heterophoxus oculatus*. There have been some recent changes to the family Pleustidae and these will be discussed at the meeting. Members should bring any pleustids to the meeting that they need help in identifying. Also, the type specimen of *Heterophoxus oculatus* will be examined at the meeting, so members may want to bring specimens to compare against. Megan Lilly (CSDMWWD) will also present her recent findings on the southern California *Octopus* problem along with slides. Please see Megan's article later in this newsletter. The meeting location is still a secret so members planning on attending will need to call the Vice President.



Chromopleustes oculatus (Holmes 1908)
(from Bousfield & Hendrycks 1995)

FUNDS FOR THIS PUBLICATION PROVIDED, IN PART, BY THE
ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.
SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

A GREAT LOSS

We report with sadness the passing of Dr. Janet Haig on November 15th. She is the second distinguished carcinologist from USC to leave us in the last few years. Although frail, Dr. Haig had seemed in relatively good health until a recent fall resulted in a broken hip. Her death was a complication of her nursing home recovery and treatment for the hip injury. It is unfortunate that she did not live to see the completion of the new *Decapods of California,* which she, along with Dr. Mary Wicksten and Dr. John Garth , had largely completed. This update and expansion of Schmitt's 1921 volume of the same name would have been a fitting cap to a lifetime of careful work on arthropod taxonomy and biology.

SPECIAL NEMERTEAN MEETING

On the 27th of October a special meeting of the "nemertean group" was held at John & Julie Ljubenkov's Dancing Coyote Ranch in the mountains behind Oceanside. Participants included John (MEC), Dean Pasko and Megan Lilly (CSDMWWD), Carol Paquette (MBC), Tony Phillips (HYP), and Don Cadien (CSDLAC). Despite the beauty of the surroundings much was accomplished. To our dismay (following two previous nemertean powwows) we still had considerable lack of agreement, even on some "well-known" taxa.

Of particular interest was the situation with *Prosorhochmus albidus*. We all thought we knew this animal well, and that it was adequately separated in the key provided by Pat Rowe during the SCCWRP Taxonomic Standardization Program meetings many years ago. There proved to be a basic dichotomy in concept of this species, with MEC and San Diego having common usage for one form and HYP and LA having common usage for another.

All four were being called *Prosorhochmus albidus* with confidence, but two forms were clearly represented. To confound this problem it proved impossible to nail down what *P. albidus* really is because of discrepancies in Coe's 1905 description of the animal, and between his and Rowe's illustrations. The original description of the animal is by Bürger in a paper not yet located by any of us. Until this reference is found and evaluated, the true *P. albidus* will remain elusive (and may not even occur here!).

We were able to dispense with several overlapping provisionals since the authors were all present. By the end of the day, while somewhat daunted by the problems remaining, we felt much had been accomplished. Such meetings will need to continue as much work remains. Thanks from all participants for the opportunity to meet in such pleasant surroundings and for the kindness of our hosts.

NEW LITERATURE

Two recent articles dealing with the amphipod genus *Microjassa* were circulated at the meeting, both by Kathleen Conlan. In the first (Conlan 1995a) she erects a new genus *Neoischyrocerus*, describes several new taxa from the northeast Pacific, and reallocates several existing species. The second (Conlan 1995b) provides supporting cladistic and zoogeographical analysis for the changes.

AMPHIPOD WORKERS

Dr. Victoria Diaz, a researcher with the ecology department at Cicese in Ensenada, B.C., is currently looking for some assistance in identifying amphipods for a project studying the macrofauna of Todos Santos Bay. The work would need to be completed before July 1996. Anyone with the interest and time available may contact Dr. Diaz by phone @ (617) 451-56 or fax @ (617) 451-54 for more information.

A SECOND *Ambidexter*

On November 8th, during night trawls to capture target fish for chemical analysis off Palos Verdes, a small unfamiliar shrimp was collected by Dave Montagne (CSDLAC). On return to the laboratory this gravid female was initially identified as *Ambidexter panamensis*, but reference to Abele's 1972 original description proved it to be *Ambidexter swifti*. This species was previously known only from the 1972 description from Panama. The single individual taken in south Santa Monica Bay represents a northern range extension of about 1500 miles .

Our specimen was taken in 50m of water over a fine sand bottom with *Lytechinus pictus* the dominant invertebrate. No other shrimp were taken, although this may only reflect net selectivity.

The type lot was taken from intertidal pools (Abele, 1972). Similarly the type lot of *Ambidexter panamensis* was taken on intertidal flats, living in burrows. Individuals of the latter species recently taken in San Diego Bay were in very shallow water, on submerged mudflats covered with algae (see "Southern Shrimp in San Diego", SCAMIT Newsletter Vol. 13#5, and "More on Shrimp", SCAMIT Newsletter Vol. 13 #6). It is not known if they were associated with burrows.

If the burrowing habitat of *A. panamensis* is also shared by *A. swifti* it is quite possible that the original collection in tide pools represented either a marginal habitat or displacement. It is also possible that a burrowing, nocturnally active shrimp species might remain undetected, even at substantial population density, in a regularly sampled area like the Southern California Bight. A similar case is known for the laomediid ghost shrimp *Naushonia macginitiei*. Although the adults are virtually unknown, having been taken only three times this century, the larvae are often taken and not uncommon in nearshore zooplankton samplings. This can be established because larval morphology for the genus is both well known and unique (Thompson, 1903). The adult habitat remains unknown, but is assumed from the few clues available in larval and adult collection data to be in an ecotone area of rocks over sandy mud not sampled by existing programs.

We can only speculate concerning the present distribution, and relative abundance of *Ambidexter swifti*, but it's presence off southern California in a reproducing population is now demonstrable. The species is separable from *A. panamensis* on the basis of telson structure (presence of setose median lobe), rostrum (presence of terminal notch [bifid], and ventral blade; longer relative to eye), and epimeron of the fifth abdominal segment (obtusely pointed instead of broadly rounded).

RETURN OF THE APRICOT GHOST

During the CSDLAC November quarterly trawl series we reencountered an animal not seen for several years, the undescribed pelagic octopoid *Opisthoteuthis sp A*. This lovely animal is a bentho-pelagic species which lives on or near the bottom in deeper water (we take it in over 300m). Apparently, it makes feeding excursions off the bottom into near-bottom waters and parachutes down onto its benthic prey from above. This octopoid has very short arms, which are united almost to their ends by web. Although muscular, the body is relatively gelatinous in response to buoyancy requirements for energy conservation. The "head" of the animal bears two thin "mickey-mouse-ear" shaped fins, which are used in a sculling motion both for raising the animal into the water column and for maneuvering.

Despite the depth at which the animals are taken, they have very large eyes, and may employ at least some visual predation. Their delicate translucent apricot color and general resemblance to the "ghosts" of Pacman video fame lead to the common name employed in the title. Dr. Eric

Hochberg of the Santa Barbara Museum of Natural History is currently working on this animal. The other *Opisthoteuthis* species from the northeast Pacific, *O. californicus*, is black, larger, and differs in many morphometric characters. Additional specimens of either would be welcomed at the museum, as would collection information related to this species.

A tentacle was taken from one of the animals and preserved appropriately for later genetic analysis. Once completed, this should contribute both to refined generic placement of this species, and better understanding of the relationships within the group of genera in which it fits. Dr. Hochberg surmises this species might actually belong to the related genus *Grimpoteuthis*.

INVASION UPDATE

It looked for a while like *Philine auriformis* was growing in size, but decreasing in population density in most places in the Bight. Our recent trawl series does not substantiate the density decline. In one 10 minute trawl at a depth of 137m off Palos Verdes we retained 766 *P. auriformis* in the net, and probably lost many others through the mesh. Specimens were found between 25 and 305m, although they were more common and also larger at 61-137m depths. The largest individuals were nearly 50mm in extended body length, considerably larger than in literature reports on New Zealand specimens. Despite examinations of stomachs from several co-occurring fish species, no other records of predation can be added to the original one of consumption by Pacific Sand Dab. Unless local predators get with it and either develop a better search image, or a taste for these animals, *P. auriformis* is poised to launch an even more massive intrusion into local benthic communities. Several size classes are present in most collections, and recruitment has clearly been good.

Reports are coming in from both the San Diego area and from Orange County of an upsurge in the population of the echiuroid *Listriolobus pelodes*. So far no comparable increase has been seen in Santa Monica Bay or the Los Angeles Area. Individuals are as yet small, and their impact will grow along with their dimensions. There is an indigenous predator for this species, the curl-fin turbot, but it may take a while for the fish to find the rich feeding grounds made available by the massive *L. pelodes* recruitment. A similar episode was witnessed and documented in the early eighties off Palos Verdes (Stull et al, 1986a,b). The species seems to recruit infrequently in any given locale, existing as a series of dense patches over a low-density background population throughout its range.

It remains to be seen if *Philine auriformis*, which the data to date seems to indicate is an opportunistic feeder using whatever prey resource is abundant nearby, will affect the course of the *Listriolobus* "bloom".

ANNELIDA NEWSGROUP

There was a recent communication on the Internet about the ANNELIDA mailing list/prototype newsgroup that was mentioned in the last volume of the SCAMIT newsletter (Vol. 14 no. 6). ANNELIDA mailing list is now available for subscriptions. It is currently only a prototype newsgroup that is distributed only by e-mail and not on USENET. It will remain this way for a 6 month trial period and then be voted on before it becomes an official newsgroup. It is being administered Dr. David Kristofferson, who is the project manager of BIOSCI, which is funded by the U.S. Department of Energy and the National Science Foundation. Dr. Geoff Read, editor of *Chaetozone,* will serve as group discussion leader.

ANNELIDA is not only for discussion of the scientific study of polychaetes, but also clitellates (oligochaetes and leeches), pogonophora, vestimentifera, sipunculans, and echiurids. Most discussions will probably focus on the ecology, taxonomy, and biodiversity of these groups. It is

expected that these discussions will be limited to annelids as whole organisms and not about annelid parts that are used in medical and biochemical research. To subscribe to ANNELIDA, if you are not already on the list through *Chaetozone*, you first need to log into the computer account in which you would like to receive e-mail and send a message to the Internet address biosci-server@net.bio.net. Leave the Subject: line of the message blank and enter the line:

subscribe annelida

into the body of the mail message. This will automatically enter your e-mail address to the mail list. Once you are a subscriber you can get information on how to post a message to the group and reply to a message. You may also find out about other biology newsgroups you might be interested in. For more information on ANNELIDA please contact the SCAMIT secretary.

MINUTES FROM NOVEMBER 13 MEETING

This meeting was held to review the proposed changes and additions to edition 1 of the SCAMIT Taxonomic Listing of Macroinvertebrates. At the meeting Dave Montagne (CSDLAC) passed out a list of the changes and additions to the list that he had compiled by group. The members present reviewed this list to see if an agreement could be reached concerning these changes and additions for the 2nd edition. It was decided that some of the changes would have to wait until edition 3 is produced next year. These are species whose publications are still in press or species that still have not been resolved and are awaiting further review. However, it was decided that several species should be left at the generic level until more specimens have been collected and further research can confirm their true identity. It was also decided at the meeting that trawl-caught invertebrates would be included in the 2nd edition of the Taxa List.

Please Note: The December 11th meeting is the deadline for additions and emendations of edition 2 of the Taxa List. All voucher sheets on provisional species that are to be included in this 2nd edition are due. If voucher sheets are not submitted for distribution thru the newsletter at this time the species name will be dropped from the list. Remember provisionals do not have to be official SCAMIT vouchers, but they need some sort of substanstial documentation that may be distributed to the membership as a whole. For example, included in this newsletter are several voucher sheets from the City of San Diego's biology lab. These were done on their own in-house voucher sheets and perfectly acceptable.

It was decided at the meeting that for flatworm provisionals, illustrations only would be accepted as substantial documentation for inclusion in edition 2, since that is mainly what is used to distinguish between species. For the 3rd edition, however, differential diagnoses should be written up.

It should be noted that 3 of San Diego's voucher sheets included with this newsletter refer to specimens from the SCBPP. They are Ampharetidae sp. SD 1, *Ophelina* sp. SD 1, and *Scolelepis* sp. SD1. They won't be included in the taxa list because not enough specimens have been found that fit their descriptions yet. Anyone with specimens similar to these should contact the appropriate author at the San Diego lab, so they may conduct further research.

It is anticipated that edition 2 of the Taxonomic Listing will be completed by the end of 1995 and, hopefully, be distributed with the January newsletter.

EDITORIAL NOTE

Sometimes it almost seems that the SCAMIT Newsletter is the house organ of whichever group

the editor and/or secretary belong to. Currently most of the information presented comes from the County Sanitation District of Los Angeles County, because both the editor and secretary are from there. It is important that a broader spectrum of opinion and comment be sought. In support of this goal we encourage all members and interested parties to contribute to the Newsletter. Contributions like that following are very valuable to the membership, providing the base of common experience that our recent SCBPP endeavor showed was often lacking. Thanks to Megan for submitting the description of her recent activities for distribution through the Newsletter. All articles which bear no authorship attribution are the product of either the editor or secretary.

Octopus OBSERVATIONS

During the 1994 Southern California Bight Pilot Project (SCBPP) trawls, two problems arose concerning local species of *Octopus*. The first being the confusion of *Octopus rubescens* Berry, 1953 with *Octopus californicus* (Berry, 1911), especially at young stages. The second problem developed with the appearance of a cryptic Mexican species, *Octopus veligero* Berry, 1953.

Octopus rubescens and *O. californicus* are fairly easy to distinguish as preserved adults, a task more difficult in the field, especially with juveniles. The depth ranges of the two species overlap with *O. rubescens* occurring from 0-300 m and *O. californicus* from 100-1000 m (but mainly between 200-500 m)(Hochberg, 1995, personal communication). The best distinguishing character is eye diameter in relationship to body size. *Octopus californicus* has extremely large eyes relative to body size while *O. rubescens* has smaller eyes relative to body size. *Octopus californicus* varies in color from orange to rust red but does not display mercurial chromatophore patterns. It also lacks well developed true papillae. The skin can appear rugose and bumpy, due to presence of stellate tubercles, but elongate papillae should be absent. In contrast, *O. rubescens* can range in color from deep reddish brown to almost white, going through many stages of mottling and displaying complex (true) papillae patterns.

As small juveniles, the animals can be distinguished by funnel organ shape and founder chromatophore patterns. *Octopus californicus* has a "v v"(double "v") shaped funnel organ and no founder chromatophores. *Octopus rubescens* has a "w" shaped funnel organ, a row of paired founder chromatophores on the ventral surface of the arms, and scattered founder chromatophores on the ventral mantle surface.

A more difficult problem was encountered with the discovery of *Octopus veligero* in southern California waters. Twelve specimens of *O. veligero* have now been taken. Two specimens were collected in 1994 during the SCBPP survey; one at station PLAFT1175 on July 27, 1994 at a depth of 210 m, and the other at station PHYFT1028 on August 11, 1994 at a depth of 128 m. The other nine animals were collected in 1995. Two were collected by CSDMWWD, one in July trawls at Station SD-11, at approximately 94 m, and the second in October trawls at Station SD-8 at approximately 100m. Seven specimens were collected by CSDLAC in August trawls at stations ranging in depth from 61-137 m, and an eighth at 137 m in south Santa Monica Bay in November.

Octopus veligero displays body patterns and behavior similar to *O. rubescens* and there is potential for confusion between these two species. The most distinctive feature of *O. veligero* which separates it from *O. rubescens* is gill lamellae count. *Octopus veligero* has 15-17 gill lamellae per demibranch where as *O. rubescens* has only 10-13 lamellae per demibranch. Another distinguishing characteristic of *O. veligero* is a pigment pattern of dark spots on the web below the eyes (they occur in the same region as false eye-spots in ocellate species) and on the lateral aspect of the mantle. The animals can be induced to display these spots in the field with manual

manipulation. The known distribution of *O. veligero* is now from the Los Angeles area south to the mouth of the Gulf of California, at depths of 61-210 m. The normal range for *O. rubescens* is from the Gulf of Alaska to approximately Pt. Eugenia, Baja California, Mexico, with the southern limit unsure at this time (Hochberg, 1995, personal communication).

In order to develop a better guide to identify *O. californicus* and *O. rubescens* in the field, and to explore the possible occurrence of *O. veligero* in San Diego waters, all octopus specimens (6 total) collected in the City of San Diego's April 1995 trawls were brought back to the lab and kept alive for approximately two months. Two *O. californicus* from CSDLAC trawls were also kept alive and observed during this period. Videotape and still photographs were taken of the animals hunting, feeding, resting, etc.

The animals were housed in 10 gallon plastic aquaria with recirculating, filtered sea water chilled to approximately 11 degrees C. Diet consisted of a variety of invertebrates and vertebrates, including *Pachygrapsus crassipes*, *Mytilus sp.* (with shells cracked to encourage feeding), "feeder" gold fish, and in one instance, *Lottia sp.* The animals were fed every two to three days on average.

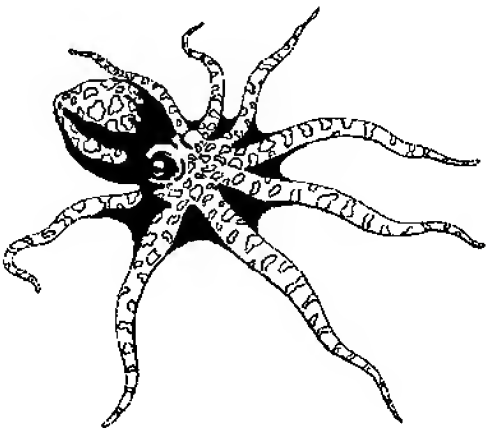
After about two months the animals started showing signs of illness (probably bacterial infection) and exhibited decreasing interest in prey items. The octopus were fixed in 10% formalin and then transferred to 75% ethanol. The six San Diego animals were dissected and identified as *Octopus rubescens* (verified by Dr. Eric Hochberg of the Santa Barbara Museum of Natural History).

The two CSDLAC animals had already been identified as *O. californicus* through live observations. The still photographs were used to create a field guide to help separate *O. rubescens* from *O. californicus.*

Still photographs were also taken of the *Octopus veligero* captured in CSDMWWD's October trawls and will be added to the original field guide (anyone interested in obtaining a copy of the field guide please contact Megan Lilly at the City of San Diego's Ocean Monitoring Program). CSDLAC is working on creating a field sheet from the observations made on the seven animals sampled in their August trawls, and will distribute them when completed.

It is suspected that *O. veligero* is not an established resident of the Southern California Bight, and that its occurrence in these waters is associated with periodic changes in oceanographic conditions (El Niño). Further research is being conducted on this problem.

------ Megan Lilly, CSDMWWD



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Treasurer	Ann Dalkey	(310)648-5611

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Volumes 8 - 13 .....$ 20.00/vol.

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CITY OF SAN DIEGO VOUCHER SHEET

Species: ***Scolelepis sp. SD 1***
Authority: Point Loma provisional

Common Synonyms:
See Comments below..

Taxa: Annelida: Spionidae
Date: 10 Nov. 95
By: R. Rowe
Voucher Specimen(s):

Station	Date	Depth	Storage Location	Voucher #
E-26(2)	4/13/93	321 ft.	Pt. Loma (see R. Velarde)	

Characters (used in lab to confirm ID):

1. Body form- Broad flattened thorax, acutely pointed prostomium
2. Notosetae absent on the first setiger
3. Occipital (median) antenna present as a short knob behind the eyes (?partially missing)
4. Eyes - 4 in a straight transverse row
5. Hooded neurosetal hooks from setiger 14 (fig. 1)
6. Hooded neurosetal hooks multidentate, a large main fang and 3 smaller accessory teeth (fig. 1)

Illustration :

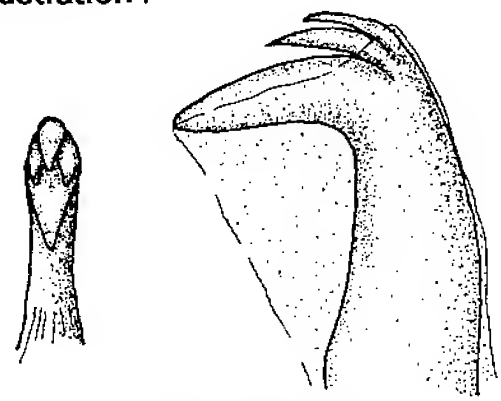


Fig. 1 Hooded neurosetal hook
(from a median setiger)
Original drawing

Full Description (cite sources):

Additional material needed
This species currently undescribed

Related Species (include character differences):

Scolelepis tridentata- Has notosetae on the first setiger
S. occidentalis- Has notosetae on the first setiger + hooded hooks are uni- or bidentate
S. squamata- Median antenna absent + has notosetae on the first setiger
S. bullibranchia- Median antenna absent + has notosetae on the first setiger + hooded hooks are tridentate
S. sp. B (M. Rossi)- Median antenna absent + Eyes in trapezoidal pattern

Comments:

More material and a description of *S. sp. B* (M. Rossi) is needed. T. Phillips reports from 60m. in Santa Monica Bay (specimens not compared to Pt. Loma material).

References: Key to non-polydorid Spionidae from Southern California (unpublished) by Dean Pasko and Larry Lovell

CITY OF SAN DIEGO VOUCHER SHEET

Species: ***Ophelina sp. SD 1***
Authority: [fide Rowe, 1995]
Common Synonyms:
This may be synonymous with
Ophelina breviata (Ehlers,1913)-see comments

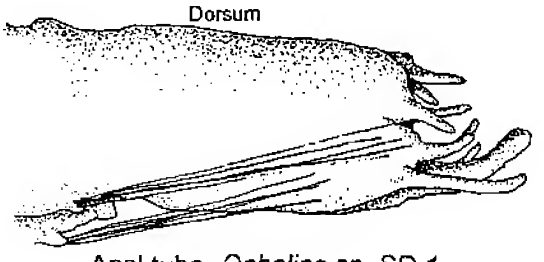
Taxa: Annelida: Opheliidae
Date: 11 November 1995
By: R. Rowe
Voucher Specimen(s):

Station	Date	Depth	Storage Location	Voucher #
E-9(1)	25July95	378ft	Pt. Loma 'DLZ'	1001
SCBPP-103	18Aug94	93m	Pt. Loma Main	in progress

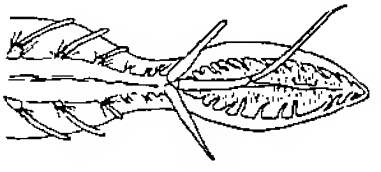
Characters (used in lab to confirm ID):

1. Ventral groove present along entire body
2. Branchiae present beginning on setiger 2 and continuing to setiger 27 (some may be missing)
3. 32 total setigers
4. No lateral eyespots
5. Proboscis fringed (similar to figure of *O.pallida* in Hartman, 1969)
6. Large 'nuchal organs' just anterior to first setae
7. Anal tube approximately as long as last 5 setigers, opens terminally with approximately 8 evenly spaced short and two 3X longer (ventral) cirri (Longer cirrus broken off in one specimen)
8. All setae are long thin capillaries, approximately 10 per fascicle, some notosetae much longer on posterior setigers

Illustration :



Anal tube- *Ophelina sp. SD 1*
Lateral view
(Original drawing)



Anal scoop- *Opelina acuminata*
Ventral view
(from Hartman, 1969 as *Ammotrypane aulogaster*)

Full Description :

Related Species (include character differences):
O. acuminata- Has open anal scoop, opening consists of a ventral slit lined with short cirri, proboscis is smooth
O. pallida- Has no anal tube-like structure
O. breviata- See comments below

Comments: The specimens of *O. sp. SD 1* fit the gross description in Hobson, 1977 and Hobson & Banse, 1981 for *O. breviata* (Ehlers). Pettibone, 1954 page 295 describes *O. breviata* with "proboscis saclike, smooth". A thorough description of *O. breviata* has not been found and specimens need to be compared to *O. sp. SD 1*.
Specimens of *O. sp. SD 1* in S. Cal. Bight Pilot Project (Stations 103, 753, & 245) were reported as *Ophelina sp.*

References: Hobson, K.D. 1977. Notes on benthic sedentariate polychaeta from British Columbia and Washington. Syesis 9:135-142.

Hobson, K.D. & K. Banse. 1981. Sedentariate and archiannelid polychaetes of British Columbia and Washington. Can. Bull. Fish. Aquat. Sci. 209:144.

Pettibone, M.H. 1954 Marine polychaete worms from Point Barrow, Alaska with additional records from the north Atlantic and north Pacific. Proc. U.S. Nat. Mus. 103(3324):203-356.

CITY OF SAN DIEGO VOUCHER SHEET

Species: Ampharetidae sp. SD 1
Authority: Point Loma, 1994
Common Synonyms:
Ampharetidae Genus A sp. A of Willams

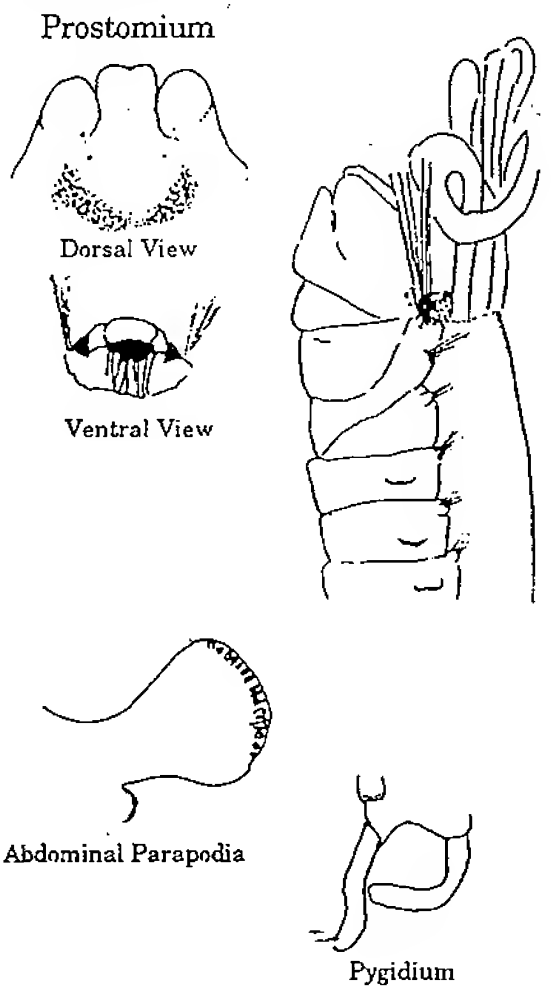
Taxon: Polychaeta: Ampharetidae
Date: February, 1995
By: K. Barwick
Voucher Specimen(s):

Station	Date	Storage Location	Voucher#
B13(2)	10/6/94	Main	TBA

Characters:

1. 12 (sometimes 13) thoracic uncingers
2. Small palae present (flabellum)
3. Lower "lip" crenulated, tips free from one another
4. Crescent shape pigment patch posterior the eyespots on the dorsal surface of the prostomium
5. 4 pairs of branchiae

Illustration: (R. Rowe)



Full Description: (Personal communication Harris 4/18/94.)

Animal with 15-16 thoracic setigers; 12-13 thoracic uncingers [usually 12]; no modified notosetae; flabellum present (small palae); first notosetae small. Prostomium with golden brown pigment on dorsal surface: trilobed with median part somewhat flask shaped with an anterior incision; lower "lip" crenulated with tips free from one another. Four pairs of branchiae on high bases. Pygidium with two lateral cirri. Small species, ovigerous at 10mm.

Related Species:

Most closely resembles *Lysippe* sp. A. Ampharetidae sp. 1 has only 12 thoracic uncingers (usually) and there is no pigment on the branchiae. *Lysippe* sp. A has much less pigment on the prostomium and the flabellum is reduced.

Comments:

References:

(over)

Species: Amparetidae sp. SD 1

Taxon: Polychaeta: Ampharetidae
Date: February, 1995

Additional Illustrations:

Distribution—

Pt. Loma: Sta. B13, 280 ft

Geographic: Point Loma. Also reported form southern California in deeper water, 1970-3000ft.

Habitat:

CITY OF SAN DIEGO VOUCHER SHEET

Species: *Notomastus latericeus*
Authority: Sars, 1851
Common Synonyms:

Taxa: Annelida: Capitellidae
Date: November 11, 1995
By: R. Rowe
Voucher Specimen(s):

Station	Date	Depth	Storage Location	Voucher #
SCBPP-1776	27July94	24m.	Pt. Loma 'DLZ'	273
ITP I-9(1)	11July95	94ft.	Pt. Loma 'DLZ'	273

Characters (used in lab to confirm ID):

1. Branchial lobes pointed (fig. 1)
2. Biramous first setiger
3. Eleven thoracic setigers with capillaries only
4. First segment asetigerous
5. No nephridial pores present in last several thoracic setigers (look in intersegmental furrow midlaterally)
6. Thoracic segments are biannulate=midsegmental furrow present
7. Methyl green staining pattern= double stripes encircle abdominal segments (one stripe ant. and one stripe post. of neurosetal fascicle) and large dark dorsal spots (one pair per segment) on large papillar organs (figs. 2 & 3)
   Some similar size specimens from same sample w/o stain on papillar organs

Full Description (cite sources): *Uebelacker, 1984 pg.14-26*

"Prostomium broadly conical, tip blunt; ocular patches present. Thoracic epithelium distinctly areolated through setigers 6-8, becoming increasingly smooth thereafter; segments biannulate. Thorax with capillary setae only in both rami. Transition from thorax to abdomen abrupt. Abdomen with hooded hooks only in both rami. Conspicuous ovoid lateral organ between noto- and neuropodia of most abdominal segments; seven or more pairs of nephridial apertures (usually inconspicuous) from second abdominal segment. Branchiae rudimentary, represented by small dorsolateral swellings of notopodia and large triangular extensions of neuropodia. Hooded hooks multidentate with main fang surmounted by up to 18 minute denticles arranged in three or more rows. Pygidium without appendages."

Illustration :

Fig. 1 First abdominal segment (anterior view)

Fig. 2 Papillar organ (lateral view)

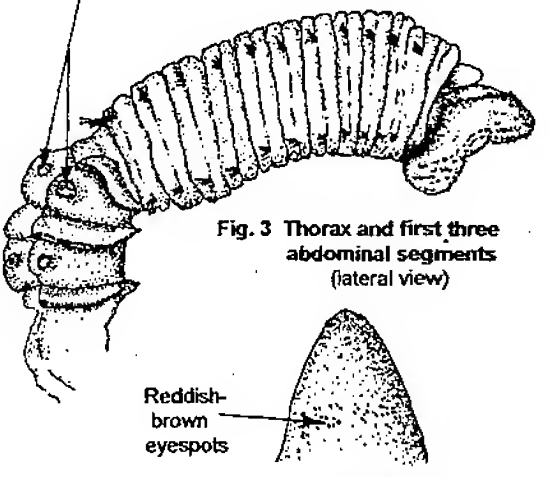


Fig. 3 Thorax and first three abdominal segments (lateral view)

Fig. 4 Prostomium (dorsal view)

Drawings are originals of first listed voucher specimen

Related Species (include character differences):

Notomastus lineatus *Claparede, 1870*– **Branchial lobes** on first few abdominal segments are **rounded** not pointed, methyl green stain different, **nephridial pores present laterally, on last few thoracic setigers in intersegmental furrow**

Comments: Fairly large, usually thorax and anterior ~10 abdominal setiger fragments. Found in shallow benthic samples. This species has been confused with *N. lineatus* locally.

References: (See Uebelacker, 1984, vol. 14, page 14-26)

CITY OF SAN DIEGO VOUCHER SHEET

Species: ***Carazziella sp. A***
Authority: [fide Velarde, 1995]
Common Synonyms:
Possibly *Carazziella phillipensis* Blake & Kudenov, 1978

Taxa: Annelida: Spionidae
Date: November 8, 1995
By: R. Rowe
Voucher Specimen(s):

Station	Date	Depth	Storage Location	Voucher #
A-8(2)	5 Jan 84	205 ft.	Pt Loma Main	P-312
SCBPP533	17 Aug 94	21m.	Pt Loma 'DLZ'	189

Characters (used in lab to confirm ID):

1. Two types of bristle-topped major spines on the fifth setiger
2. Branchiae begin on setiger 7, some nearly reach middorsum, present on 10-11 setigers
3. Bifid neuropodial hooks begin on setiger 8 (number ~4-7 per fascicle on anterior setigers)
4. Caruncle short, extending to posterior margin of setiger 2, split by transverse void or groove at posterior margin of setiger 1
5. Occipital tentacle is absent
6. Prostomium rounded with shallow incision at anterior margin
7. Full fascicle of capillary notosetae on first setiger
8. Few fine superior and more numerous inferior capillary setae on setiger 5
9. Two pair of eyes, the anterior larger
10. Pygidium with four subequal triangular lobes

Illustration (following figures from Blake and Kudenov,1978 of *Carazziella phillipensis*)

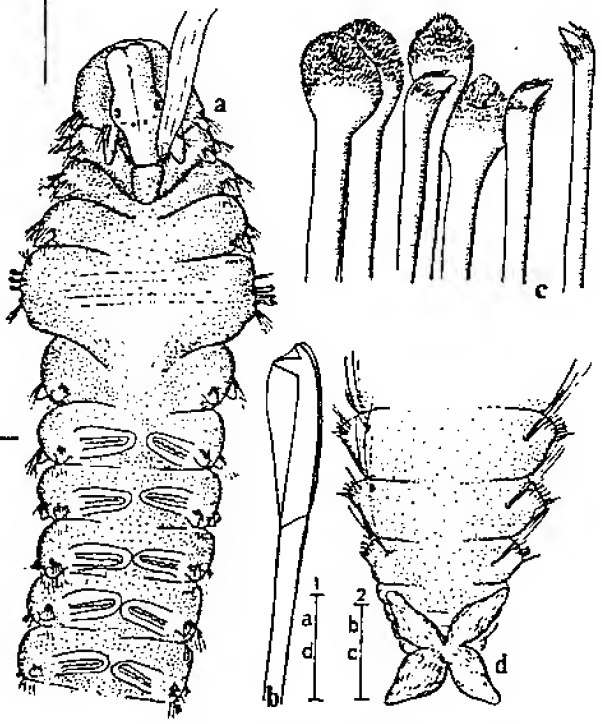


Figure 33.—*Carazziella phillipensis* sp. nov.—a, anterior end in dorsal view; b, hooded hook; c, group of spines from setiger 5; d, posterior end in dorsal view. [Scale 1 = 200 µm; 2 = 20 µm]

Full Description:
See the original description of *Carazziella phillipensis*, Blake and Kudenov, 1978 and related species below. Voucher specimen from Pt. Loma 'DLZ'-189 is an entire worm (38 setigers) with a length of approximately 5mm.

Related Species (character differences):

C. phillipensis - *C. sp. A* is nearly identical and may prove synonymous upon comparison of specimens. *C. sp. A* has a few more notosetae on the 1st setiger, and the hooded hooks are bifid throughout with a main fang that is slightly more obtuse. *C. phillipensis* branchiae on 5-6 setigers. See the original description of *C. phillipensis*.

C. citrona (Hartman, 1941) see Blake, 1979- Has prostomium with an entire anterior margin, hooks from setiger 10 number 15-18 per fascicle, and larger (to 30mm and 120 setigers). Branchiae present on 70 setigers

C. calafia Blake, 1979- No superior capillaries on setiger 5.

C. hobsonae Blake, 1979- No notosetae on setiger 1 and anterior setigers with only 3 hooks per fascicle.

C. reishi (Woodwick, 1964)- No eyes,only 2-3 hooks anteriorly, pygidium with 4 short lobes, and smooth spines on 5th Branchiae present on only 5 setigers.

References:

Blake, J. A. & J.D. Kudenov, 1978. The Spionidae from southeastern Australia and adjacent seas with a revision of the genera. Mem. Nat. Mus. Vic.39:171-280.

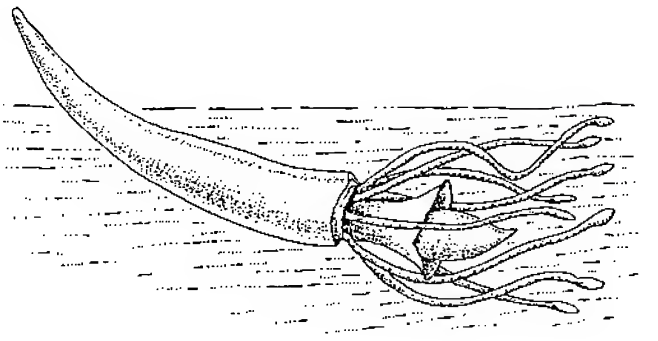
Blake, J. A. 1979. Four new species of *Carazziella* from North and South America, with a redescription of two previously described forms. Proc. Biol. Soc. Wash. 92(3):466-481.

December, 1995 SCAMIT Newsletter Vol. 14, No.8

NEXT MEETING:	Scaphopods
GUEST SPEAKER:	Don Cadien - CSDLAC
DATE:	January 16, 1996
TIME:	9:30am - 3:30pm
LOCATION:	Natural History Museum of Los Angeles County 900 Exposition Blvd. Times Mirror Room

JANUARY 16th MEETING

Our January meeting will be largely an information transfer meeting for us to examine and evaluate the materials on scaphopods distributed by Ron Shimek at the last NAMIT workshop. We will attempt to integrate Ron's work on the fauna from the northern portion of the Southern California Bight up to western Canada with information and specimens from the central and southern portions of the Bight. We will also draw on the collections of the Los Angeles County Museum of Natural History for comparative materials, and specimens of rarer species from our area. Please bring specimens of all species of scaphopods you report from your programs to the meeting for comparison.



A dentaliid scaphopod beneath the sediment surface with foot and captaculi extended (from Meglitch, P.A. 1972. Invertebrate Zoology, ed. 2)

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ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.
SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

CHRISTMAS PARTY

On Saturday, December 2nd, SCAMIT held its annual Christmas Party at the Cabrillo Marine Aquarium. Although, many SCAMIT members from the San Diego area were unable to attend there was still a nice turnout with lots and lots of yummy food. Leslie Harris proved to all present that taxonomists do have other hidden talents with her gorgeous Christmas tree cake complete with handmade ornaments and presents.

The SCAMIT orchestra consisting of Ann Dalkey, Larry Lovell, John Shisko's daughters, Emily, Anne, and Carrie serenaded us all with Christmas carols much to the delight of everyone present. We greatly thank them for sharing their talent with us.

The evening ended with a visit from jolly ol' St. Nick (or St. Mary, as in Mary Cadien). Mary did a wonderful job filling in for Santa "John" Claus, who was too busy supervising the elves this year. Once again, Vice President Don Cadien did a fabulous job of arranging all the festivities. We also thank the Cabrillo Marine Aquarium for the use of its facility.

FUTURE MEETINGS

Currently, the February meeting will be a polychaete meeting on the family Lumbrineridae and hosted by Larry Lovell in Vista. The March meeting will be on aplacophores with Dr. Amalie Scheltema of Woods Hole Oceanographic Institute and will be held at the Santa Barbara Museum of Natural History. Tentatively scheduled for April is a meeting on California cephalaspids with Terry Gosliner from the Cal Academy of Sciences, John Ljubenkov, and Don Cadien. The venue for this meeting remains uncertain, although a second meeting at Dancing Coyote Ranch remains a possibility. SCAMIT Vice President, Don Cadien is also looking for other invertebrate topics for the rest of next year. A meeting on nuculanid pelecypods has been suggested. Please feel free to submit any ideas for future meetings to Don.

NEW LITERATURE

Another volume of the *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel* is now out. Those of you with subscriptions to the Atlas should be receiving your copy soon if you haven't already. This volume 5 - The Annelida Part 2 covers the orders Phyllodocida (Syllidae and Scale-bearing families), Amphinomida, and Eunicida.

Member Mary Bergen has a paper in the latest Bulletin of the Southern California Academy of Sciences dealing with the distribution of the ophiuroids *Amphiodia urtica/digitata* in the Southern California Bight. Based on the State Survey collections of 1956-1959, her analysis examines the relationship between sediment granulometry, geographical position in the Bight and abundance of these ophiuroids in an attempt to better define "reference" conditions in the Bight.

A NUISANCE DIGEST?

A newsletter that some SCAMIT members may find interesting is a new quarterly publication by the Freshwater Foundation called ANS (Aquatic Nuisance Species) Digest. This publication provides current information on monitoring and controlling the spread of harmful nonindigenous species. The November issue includes an article by SCAMIT member, Gretchen Lambert and her husband Charles, on nonindigenous sea squirts in California harbors. Also, in this issue is an article by Andrew Cohen on the Chinese mitten crab and its introduction to North America. This crab created severe problems of damage to levees and earthen dams in Europe during the 1930's, with much attendant financial loss. SCAMIT recently had a flyer in the newsletter about the species. Those interested in this publication should contact:

Freshwater Foundation
Gray Freshwater Center
2500 Shadywood Road
Navarre, MN 55331
(612) 471-9773
fax: (612) 471-7685
e-mail: frshwtr@freshwater.org

SCAMIT TAXA LIST

Due to scheduling conflicts amongst members of SCAMIT's executive committee the final meeting to finish edition 2 of the Taxonomic Listing will not be until January. This gives members a second chance to submit any last minute voucher sheets or descriptions of species to be included in this edition. However, they should all be in by the end of this year. The 2nd edition should be out early next year.

Included in this newsletter are several voucher sheets on nemerteans and isaeids, many on species found in the SCBPP. Many of these voucher sheets are the result of the special nemertean meeting held at the end of October. (Refer to SCAMIT newsletter Vol. 14 no.7)

NAMIT MOLLUSCAN WORKSHOP

by Kelvin Barwick

The Northern Association of Marine Invertebrate Taxonomists (NAMIT) held a molluscan workshop in Seattle, Washington on November 18-19, 1995. It was hosted by the Seattle Aquarium. The organizer was Roland Anderson, Curator of marine invertebrates at the Aquarium. The topics covered included; Cephalopods, selected Gastropods, Scaphopods, benthic Opisthobranchs, Chitons, and selected Bivalves.

The first day began with a brief introduction by all the attendees followed by the first speaker, Roland Anderson. He discussed problems associated with identifying cephalopods commonly found in Puget Sound. Dr. Ronald L. Shimek, a professor at Montana State University, spoke on some of the more difficult groups of gastropods including the pyramidellids and turrids. He also previewed his work on the scaphopod section of the *Taxonomic Atlas of the Santa Maria Basin.* In closing, Sandra Millen (Ph.D.), a professor at the University of British Columbia, reviewed the northern species of benthic opisthobranchs.

The second day began with a live molluscan feeding demonstration held in the public aquarium. The first speaker of the day was Roger Clark. He reviewed the common species of chitons encountered in Puget Sound. Next was Susan Weeks who gave a brief introduction to bivalve morphology. She then conducted a mini workshop on bivalves by attempting to identify problem animals brought by participants.

Hats off to NAMIT for putting together an excellent workshop. Thanks to the host and organizer, Roland Anderson, who did an excellent job. All the presenters were superb. The next workshop will be on micro-crustacea

held at Friday Harbor. It is tentatively planned for late January or early February.

SCAMIT members interested on notes from this workshop should consider joining NAMIT. Dues are the same as SCAMIT's, a mere $15 per year. For membership information contact:

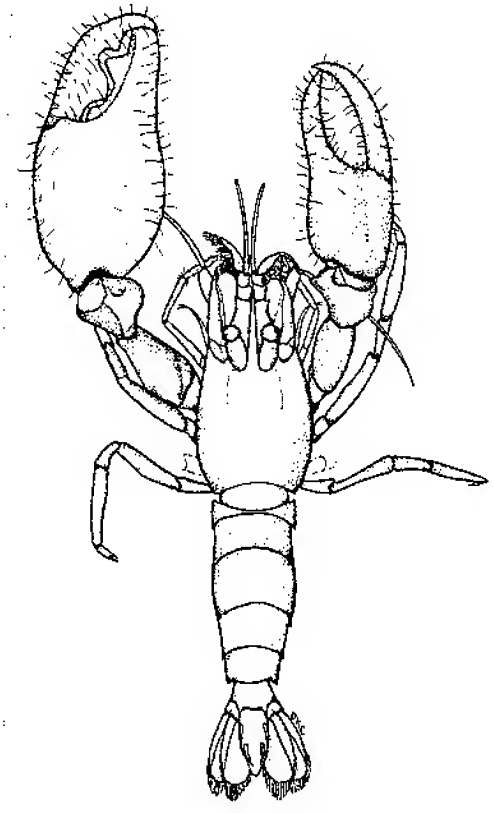
Roberto Llanso
State of Washington
Department of Ecology
300 Desmond Drive
P.O. Box 47710
Olympia, Washington 98504-7710

SYMBIOSIS IN ACTION

One of the advantages of having a varied monitoring program is the ability to sample habitats not covered in most permits. At CSDLAC we have the responsibility of monitoring inshore hard bottom communities by diver observation. During the November dives off Palos Verdes Pt. Dave Montagne spotted a large *Pyura mirabilis* hidden in a crevice in about 12m of water. He usually checks these tunicates for commensals, and this time his efforts were crowned with success. Once the tunicate was opened a large female *Pontonia californiensis* Rathbun 1902 was found inside. Both the tunicate and it's shrimp symbiont were collected for laboratory examination.

This shrimp is seldom seen, only four prior records being known to the writer; the original description from 55m off Santa Cruz Island, from off Santa Rosa Island at 27-29m (Holthuis, 1951), Word and Charwat's (1976) record from 26m on Engel's Bank in the tunicate *Ascidia vermiformis*, and at 43m off Carmel in the tunicate *Ascidia paratropa* (Standing 1981). The animal is eyed, despite its residence inside the thick opaque tunic of the ascidian, and is of a nearly uniform translucent dull orange brown, a color that closely matched the coloration of the internal tissues of its host. The internal organs, including the ripe ovaries, were clearly visible through the carapace. On closer examination the body, the legs, and the dorsal side of the chelae bore scattered minute dots of dull red.

For an animal leading such a retiring existence this female was quite assertive. When approached from the front with forceps she reached forward and snapped her chelae noisily, grasping and pinching the intruder. Her chelae were so disproportionately large as to resemble those of a homarid lobster or a scorpion. Her anterior end was kept low, and her tail flexed up in a "cocked" position to allow rapid escape (should she desire to run rather than fight). As might be expected she was negatively phototactic, and retired to the least well lit portion of the dish. If gently turned over she seemed to be perfectly at home in inverted orientation, laying calmly on her back and kicking her legs in the water.



Pontonia californiensis Rathbun 1902

She was much as illustrated (above) in Word and Charwat's Shrimp volume, but had a proportionately shorter rostrum, and a strongly medially curved tooth on the anterolateral corner of the antennal scale. Unlike many commensal palaemonids, she was not accompanied by a mate. After the tunicate was initially opened underwater it was maintained in a closed container until returned to the surface; there was no opportunity for escape from the host.

The preserved specimen is maintained in the Marine Biology Lab, CSDLAC, Carson, California. -Don Cadien

MINUTES FROM DECEMBER 11TH MEETING

The December meeting held at the County Sanitation District of Los Angeles was in two parts. The morning session focused on the *Octopus* problems that arose from the SCBPP and was led by Megan Lilly (CSDMWWD). Please refer to he article entitled, "*Octopus* Observations" in last month's newsletter. The afternoon session was led by Don Cadien and dealt with amphipods.

The meeting opened with Megan passing out laminated field sheets of *Octopus rubescens*, *O. veligero*, and *O. californicus* to all the major POTW's to assist them with correct identifications in their fieldwork. These sheets included photographs of these 3 species live depicting various characteristics that may be used to distinguish between them.

Megan also showed several slides of the live octopods that she had housed in aquaria for several months at San Diego's lab. In the slides she pointed out some of the distinguishing characteristics that separate these 3 species as she described in last month's newsletter.

She also passed out a packet of handouts with diagrams of a typical octopus, the mantle cavity, and funnel organ, as well as distribution maps for the 3 species and a useful pictorial character table done by Dr. Eric Hochberg (included in this newsletter). While this table is incomplete and Dr. Hochberg plans to add to it in future, it is a valuable resource now and we thank him for sharing it with us.

To give all the members present a better idea of the double "v" and "w" shaped funnel organs in *O. californicus* and *O. rubescens*, Megan demonstrated how to dissect the funnel on a preserved specimen. By making a vertical slit with a small pair of scissors along the funnel starting at the base it is then easy to pull the sides of the funnel back to examine the organ inside for the "v" or "w" shape. It should be noted that it is sometimes difficult to see this organ depending on the size of the octopus and the preserved condition of it.

Megan also demonstrated how to dissect the mantle of an octopus to determine the gill count, another characteristic used in taxonomic keys. The mantle should be cut on the ventral side above the funnel and to the left of the septum. The mantle may also be peeled back to show the lamellae of the gills, which may then be counted. There should be 10-13 in *O. rubescens* and 15-17 in *O. veligero* .

After lunch we watched a video shot at San Diego's lab on the octopods that were housed in the aquaria for several months. The video showed the interesting hunting and feeding behavior of several of the octopods with various prey items. The octopods got very excited at feeding time and displayed interesting color patterns, aggression displays, and fighting over food.

After the video we moved on to amphipods with Don Cadien. No detailed discussions of the changed taxonomic status of any of the pleustid species took place. We did, however, agree on the adoption of the changes introduced by

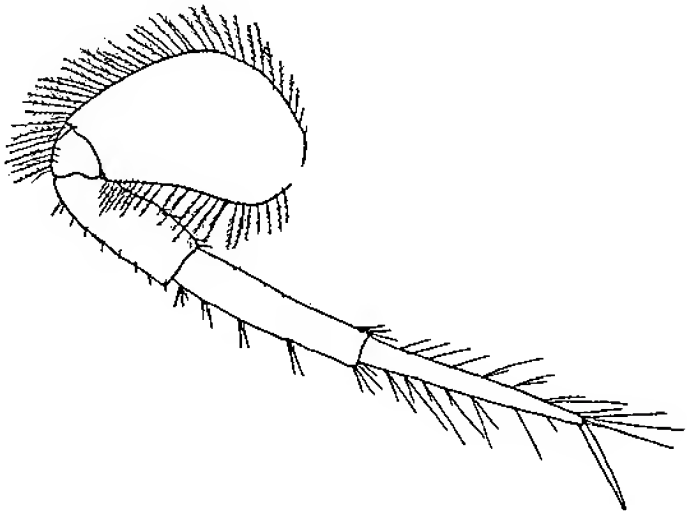
Bousfield and Hendrycks (see below) into our standard local practice. It was agreed that, although we may eventually choose not to use some of the innovations, the new definitions and subfamilial arrangement of the family are coherant and deserve adoption.

Only if we are actively using the modified taxonomy presented by Bousfield and Hendrycks will problems become apparent. Any which do arise can be circulated through the Newsletter and discussed. Some of the proposed changes may eventually be rejected, and at that time our standard practice will again be modified. A summary of how these changes affect prior local usage was appended in tabular form to SCAMIT Newsletter Vol. 14 #5. An elaboration of the information in that table is presented below.

After this discussion of pleustids we examined the type of *Heterophoxus oculatus* Holmes, 1908, on loan from the Smithsonian. The adult female holotype was collected off South Coronado Island in 63-66 fms in 1904. The type consists of the animal in alcohol and three slide mounts of removed parts. The mounted parts are, after 90 years, so nearly even in refractive index to the mountant that they are nearly invisible. Once located, however, they are still in fine condition and can be examined easily with a compound microscope. A complete set of mouthparts, including upper lips, mandibles, maxillas 1 and 2, and maxillipeds is on the slides. One each of antenna one, antenna two, gnathopod 1, epimeron 3, uropod 3, pereopod 6, and pereopod 7 are also present.

Initial counts by the three attendees indicated that the 21-22 ventral setae on the 3rd epimeron listed by Holmes in his original description may be in error. Each of us found only 15-17 ventral setae on the epimeron still attached to the holotype (the left). The right epimeron had been removed and mounted. It bears 21 setae, matching the count mentioned in the original description. The count of 15-17 matches those taken from the largest individuals examined by Dean Pasko at Pt. Loma, at MBC by Carol Paquette, and at CSDLAC by myself. None of us was ever able to find an individual with a count as high as that on Holmes' holotype female.

Examination of the setation pattern of article six of the sixth pereopod showed it much as indicated by Jarrett and Bousfield (1994); with doubly inserted setae along the posterior margin. In specimens from Pt. Loma, off Palos Verdes, and from various sites in the Bight (Carol Paquette) the smallest individuals lacked doubly inserted setal groups, and even the largest specimens generally had the most proximal groups composed of but a single seta. This is in conformance with the Jarrett & Bousfield concept of the species, which is that distally located setal groups on article six of pereopod six bear doubly inserted setae. The holotype has eight setal groups along the posterior margin of article six of pereopod six, the first three of which are singly, the last five doubly inserted. The multi-setose terminal group is excluded from the above count. The relative lengths of the fifth and sixth articles of pereopod six are not as unequal as indicated in Holmes' illustration (1908, pg.521, fig. 28 - reproduced below).



The drawing shows article six about 20% longer than article five; leading to the assertion in the Jarrett & Bousfield key that it is "distinctly

longer". The holotype's mounted left sixth pereopod shows that, although article six is slightly longer, it only exceeds article five in length by about 5%, meriting a description as subequal rather than distinctly longer.

As the condition of the mandible other than the palp was not presented in Holmes' description I provide information gleaned from examination of the holotype. The left mandible has 4 teeth on the incisor, with the lacinia mobilis bearing one large multicusped mesial tooth and a series of 4-5 small denticles; the blades of the raker row number 13, and are pectinate on the distal 2/3 of their posterior faces. Each is accompanied basally by a slender plumose seta about 1/2 it's length. The molar is a low elongate hump bearing three posteriorly pectinate blades along it's dorsum. These appear to merely continue the raker row, but are physically discontinuous. The right mandible has 4 incisor teeth, and the lacinia mobilis bears 7 denticles, with the mesial one largest; the raker row bears 13 blades, as on the left mandible. The blades on the molar hump are not clearly distinguishable in the slide preparation of the right mandible.

One of the unknowns surrounding this species can be definitely answered. There is well developed setosity on the pleonites dorsally on the holotype, a condition which is specifically excluded in the original description of *Heterophoxus conlanae*. It thus appears likely that *H. conlanae* and *H. oculatus* are not synonymous, even though the characters called out in the Jarrett & Bousfield key are not reliable for their separation in southern California (if *H. conlanae* occurs here). - Don Cadien

DISCUSSION OF PLEUSTID TAXONOMY

Several recent revisionary papers have addressed the taxonomy of the amphipod family Pleustidae in the northeastern Pacific (Bousfield & Hendrycks 1994a, 1994b, 1995). These are the first three of an estimated five articles completely revising the fauna, and affecting the family worldwide. The impetus for this revision came from the large series of collections made on the western coast of Canada and in Alaska during the 1950's and 1960's by representatives of Canadian institutions.

A new subfamilial division of the Pleustidae is proposed in the first of these articles (Bousfield & Hendrycks 1994a). It and the character analyses which underlie it form the basis for much of what follows in the later articles. An extended discussion of the morphology and deduced evolutionary trends within the family is presented here. Attempts are made to evaluate the relative apomorphy of each of the new subfamilies in order to properly orient the evolutionary flow of morphological change. The analyses are not as rigorous as the transformation series offered by Fitzhugh in his analysis of the Sabellidae (Fitzhugh 1989), but nearly always seem logically derived and are often supported by more than just conjecture.

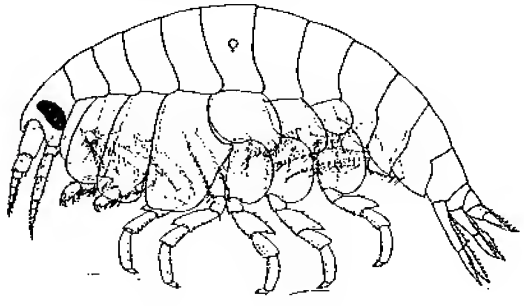
Of the twelve subfamilies erected half are represented in California waters: Stenopleustinae, Pleusymtinae, Dactylopleustinae, Pleustinae, Pleusirinae, and Parapleustinae. Of these the Pleustinae were covered in Bousfield & Hendrycks 1994b, and the Parapleustinae, Dactylopleustinae and Pleusirinae in Bousfield & Hendrycks 1995. The Stenopleustinae and Pleusymtinae are slated for coverage in forthcoming parts of the series.

The subfamily Pleustinae contains relatively large, often highly ornamented species with many representatives in boreal and arctic waters and few California representatives. Prior to the 1994 review the two species occurring in Californian waters were both allocated to the genus *Pleustes* as *P. depressus* and *P. platypa*. Both species are listed in the SCAMIT Benthic Species List Edition 1 under those names. Both were transferred by Bousfield and Hendrycks (1994b) to the newly erected genus *Thorlaksonius*

as *T. depressus* and *T. platypus*. These species, as nearly all other members of the subfamily, have relatively large rostrums. They were both illustrated in Barnard and Given (1960), and have probably been reliably distinguished in our area in the past.

The remaining species in the subfamily are all from cooler waters further north. The closest record of any other member of the subfamily is that of *T. grandirostris* from central Oregon (not central California as stated by Bousfield and Hendrycks in the discussion of distributional ecology for this species). Previous experience with range information in amphipods suggests, however, that many of the species not currently known from south of Vancouver Island may be found in some situations in the Southern California Bight (particularly on offshore islands). Within the Pleustinae species can be distinguished on the basis of gross external characters of the rostrum, gnathopods, coxal shape and ornamentation, and body carination.

Members of the Dactylopleustinae and Pleusirinae also have easily visible external characters of the appendages which allow their recognition and separation without the necessity of mouthpart dissection. Prior to Bousfield & Hendryck's treatment of the subfamily (1995) only two described species were known, *Dactylopleustes echinoicus* (Tzvetkova, 1975) from Alaska and Kamchatka, and *Dactylopleustes obsolescens* Hirayama, 1988 from Japan. They added a third species from British Columbia *Dactylopleustes echinoides*.



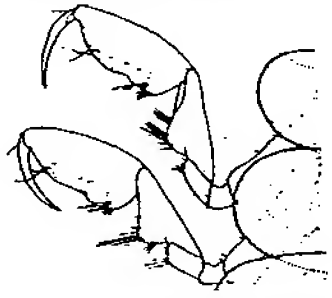
D. echinoides Bousfield & Hendrycks 1995

All three of these species are assumed to be commensal with strongylocentrotid urchins, although no host is yet known for *D. obsolescens*. In actuality none of these species are known from enough occurrences to warrant generalizations about their ecology. The most that can be said is that so far collections of these species seem to indicate host specificity to individual urchin species. *Strongylocentrotus polyacanthus* was the recorded host for *D. echinoicus*, while *S. purpuratus* was the inferred host for *D. echinoides* based on common occurrence at the type locality.

In the Southern California Bight the only species currently recognized is the provisional *Dactylopleustes sp A* found in association both with *Allocentrotus fragilis* and *Lytechinus pictus*. This association has been directly observed, with the commensal being removed from the host by the collector (*fide* Ron Velarde). This is currently the only record of a member of the genus from more than one host species; in this case from host species in different families (Strongylocentrotidae and Toxopneustidae). This is only the second report which directly links the commensal with the host through observation rather than indirectly through co-occurrence. Reports of the three northern species have so far been restricted to shallow water, algal associated urchins, and hard substrates. Although *D. echinoides* is assumed an associate of *S. purpuratus,* it was taken in clumps of surf-grass (*Phyllospadix*) or under algal mat (Bousfield and Hendrycks, 1995). It is not inconceivable that this habitat could also harbor urchins large enough to serve as hosts, but this seems unlikely. Perhaps this offers evidence that not all members of the genus are obligate echinoid commensals. After all, the specially modified dactyls which so admirably fit urchin spines could as easily grasp any other columnar or tubular structure of appropriate diameter (such as the thalli of mat-forming algae).

The subfamily Pleusirinae is represented in the Southern California Bight only by *Pleusirus*

secorrus J. L. Barnard 1969. It has only one other member, the subspecies *P. s. asiaticus* from Sakhalin Id. and the Sea of Okhotsk, and from Possjet Bay in the Sea of Japan. Bousfield & Hendrycks (1995) suggest this needs reexamination to verify its status. The subfamily, with its single genus, is easily recognized by the configuration of the gnathopodal carpi, which are elongate, and bear a shallow mid posterior lobe which makes the segment triangular.



Gnathopods of *Pleusirus secorrus* (from Bousfield & Hendrycks, 1995)

The majority of the pleustid species recorded from the Southern California Bight fall into the family Parapleustinae, and prior to the current revisions were all considered members of the genus *Parapleustes*. Seven species in the subfamily are recorded from locations within the Bight (plus a doubtful record of an eighth), only three of which were listed in Edition 1 of the SCAMIT Benthic Invertebrate List - *Parapleustes behningi*, *Parapleustes oculatus*, and *Parapleustes pugettensis*. None of these species retain the same names following the revision.

Parapleustes behningi, which had been *Parapleustes nautilus* prior to its synonymy by Barnard & Karaman (1991), was again separated from *P. nautilus* by Bousfield & Hendrycks (1995) and both were placed in the new genus *Micropleustes*. In reestablishing *M. nautilus* they indicate that *M. behningi* only occurs in the Sea of Japan, and that eastern Pacific occurrences are *M. nautilus*. Barnard's 1969 record of *Parapleustes sp A* is questionably assigned to their newly described *M. nautiloides* by Bousfield and Hendrycks (1995). Their "possibly central California" distributional record (Distributional ecology - pg 115) is in error, presumably being based on Barnard's 1969 record from La Jolla of *Parapleustes sp A*.

Parapleustes commensalis Shoemaker 1952, which was taken originally off Santa Barbara on the pleopods of a California spiny lobster, has also been taken further to the south in Santa Monica Bay, and probably elsewhere. Although the animal may be quite common it is rarely reported. Bousfield and Hendrycks (1995) erected a new genus (*Commensipleustes*) to contain the single species *commensalis*. The validity of this genus is questionable, for reasons which will be presented separately. Wicksten's record (1982) of this species from a different host, *Paralithodes californicus*, is probably a misidentification of a similar but undescribed pleustid. Numerous amphipod samples from both *P. californicus* and *P. rathbuni* examined in the Bight have contained no *C. commensalis*, but two different undescribed species have been found, neither in *Commensipleustes* as currently constituted.

Barnard's *Parapleustes den* was transferred to the new genus *Gnathopleustes* by Bousfield and Hendrycks (1995). This is a shallow water species not yet encountered in the Bight in any POTW monitoring programs, and thus not on the SCAMIT list. The genus is better represented to the north. It's members have large strongly subchelate sexually dimorphic gnathopods.

Previous shallow-water collections in the Bight have contained animals identified as *Parapleustes pugettensis*. These are apparently all misidentifications. The "true *P. pugettensis*" of Dana as defined by Bousfield and Hendrycks (1995) does not occur in the Bight. Two taxa which have been previously synonymized with it, and are now resurrected, do; both allocated to the rehabilitated genus *Incisocalliope*. This was originally created by Barnard (1959) to house *I. newportensis*, a species disavowed and synonymized with *P. pugettensis* by its author the following year (Barnard & Given 1960). A

second member of the genus is also recorded from the Bight, *I. bairdi*, which is distinguished from *I. newportensis* on the basis of antennal segment lengths, and proportions of some leg segments. *Parapleustes pugettensis* is now transferred to the genus *Gnathopleustes*. None of the POTW records of *P. pugettensis* can be accepted, although it is likely that they refer to one or the other of the above *Incisocalliope* species. Until each specimen is reexamined in light of Bousfield & Hendrycks (1995) to provide a corrected identification, data could be modified to read *Incisocalliope sp*, and records of *Parapleustes pugettensis* purged from the database.

A similar problem affects identifications of *Parapleustes oculatus* which has been transferred to the newly created genus *Chromopleustes* Bousfield & Hendrycks 1995 and redefined. Barnard & Givens specimens identified as *P. oculatus* (Holmes 1908) have been separated as a differing undescribed form named *Chromopleustes sp 1* by Bousfield & Hendrycks. In consequence historic records in POTW databases require reexamination using the new definitions of *C. oculatus* provided in their review (1995). Records could be corrected to *Chromopleustes sp* in the interim.

At least two other undescribed pleustid species (mentioned above) are found commensally on decapods in the Bight. One is a pure white species with specially modified pereopodal dactyls which is found on the carapace, abdomen, and legs of lithodid crabs in the genus *Paralithodes*. These animals have adopted a different type of structural modification from that used by either *Commensipleustes* which have setose propods against which the dactyls close for grasping setae or *Dactylopleustes*, which have hooklike modified dactyls shaped for grasping spines. The dactyls of this provisional "sucker-foot" species are of normally slender recurved type, but bear a flat flexible disc on their mesial surface. In observations of living animals it becomes clear that these discs are used in analogous fashion to the suction cups of window washers. They are pressed against the substrate (in this case the surface of the crab exoskeleton), forming a close adherent suction. When the animal wishes to move this leg it must first break the suction by a twisting lateral motion before the leg can be repositioned and reattached to the surface. The animals are quite adept at such movements on the host, where they will scoot along the surface to a sheltered position between elevations or tubercles before coming to rest.

A second undescribed pleustid is found commensal with decapods in our area, but this is pigmented with brown blotches on a white ground in life (though fading to white in preservative). This animal resembles the old concept of *Parapleustes pugettensis* as used by Barnard and Given 1960 in most gross aspects, but is clearly separable on the basis of the live coloration. Investigations are underway to determine which (if any) of the newly created genera of pleustids is appropriate for this species. Unlike the other commensal pleustids from the Bight, this species has no special modifications of the dactyls for position keeping. This species is catholic in its choice of hosts, occurring on several lithodids, on the majid *Loxorhynchus grandis*, and once on a large *Cancer*.

North of Pt. Conception, and particularly north of Oregon the pleustid fauna becomes much larger, with numerous new species in the genera *Gnathopleustes*, *Thorlaksonius*, and *Pleustes*. Some of these taxa may yet be discovered in the Southern California Bight. There may also be additional new species from our area described in the upcoming portions of this revisionary series dealing with the Pleusymtinae and Stenopleustinae. We also may find that the problems of introduced taxa found so frequently in nearshore marine environments are also manifest in the pleustids. *Incisocalliope derzhavini*, for instance, has been taken for some time in San Francisco Bay. This problem would be expected more frequently in estuarine associated groups such as *Incisocalliope* than in

the open coastal and offshore pleustids.

The pleustid fauna of the Southern California Bight (as presently known), thus contains the following species:

Chromopleustes oculatus (Holmes 1908)
Chromopleustes sp 1 Bousfield & Hendrycks *1995*
Commensipleustes commensalis (Shoemaker 1952)
Dactylopleustes sp A SCAMIT 1988
Gnathopleustes den (J. L. Barnard 1969)
Incisocalliope bairdi (Boeck 1871)
Incisocalliope newportensis J.L. Barnard 1959
Micropleustes nautilus (J.L. Barnard 1969)
?*Micropleustes nautiloides* Bousfield & Hendrycks 1995
Pleusirus secorrus J. L. Barnard 1969
Pleusymtes subglaber Barnard & Given 1960
Stenopleustes monocuspis Barnard & Given 1960
Thorlaksonius depressus (Alderman 1936)
Thorlaksonius platypus Barnard & Given 1960
"sucker-foot" pleustid
"brown-blotched" pleustid

COPYRIGHT LAW

In the 1 December issue of *Science* there is an article discussing the outcome of the Texaco case and its affect on photocopying by scientists ("How Does the Texaco Case Affect Photocopying by Scientists". Science 270: 1450-1451). The decision by the U.S. Court of Appeals in the case *American Geophysical Union* v. Texaco, Inc. does appear to affect photocopying practices that have been accepted as reasonable in scientific research. The decision suggests that any large, commercial, for-profit, corporation where employees systematically make copies of journal articles for archival purposes probably violates the copyright law. The court did, however, state two kinds of copying that it did not address in its decision. They are 1) an independent researcher copying articles for his/her own research, who is not employed by an institution that he/she is conducting the research for and 2) photocopying for personal use by an individual.

The court decision in this case raises many unresolved questions for scientists. For instance, "Is archival copying fair use if it is not systematic?" and "May an individual make copies for research purposes from a journal they received as membership in a scientific association?" Another important question that needs to be addressed is whether the distinction made between scientists working in industry and those employed by the government or an academic institution is actually valid since all are conducting research of potentially commercial value.

It would seem that the only lawful way for a scientist to obtain a copy of a publication is from the author directly, which may not be possible since publishers typically limit the number of reprints the author may obtain at no cost. Of course, the author may pay for more reprints so he can distribute his own research, but why should the author have to incur this expense. The main compensation a researcher receives for his contribution to science doesn't come in the form of any financial gain. The compensation comes from the recognition they receive in having their work disseminated, not only amongst their colleagues and peers, but the widest possible audience. Are we saying that the scientist should pay for the consumer's privilege of reading his research? This seems a bit backwards. Perhaps the publishers that seem so forthright in pursuing the enforcement of the Copyright Act might want to remember that without research to publish they would not be in business. Or perhaps they would like to share the royalties or copying fees they receive from the Copyright Clearance Center with the individual authors.

For those who find the topic sufficiently engaging there is now an electronic forum available for discussion of copyright law in

relation to scholarly publishing. This can be accessed through information provided in the "Beyond the Printed Page" section of *Science* On-Line (http://science-mag.aaas.org/science/).

EMPLOYMENT OPPORTUNITY

The Natural History Museum of Los Angeles County has an immediate opening for a Collections Manager in the Crustacea Section. Please see the flyer enclosed with this newsletter for more information.

A CORRECTION

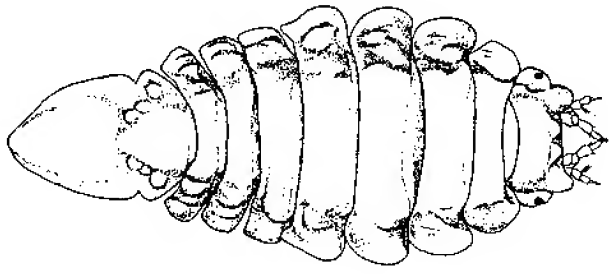
In the last issue of the Newsletter (Vol. 14 #7) I reported collection of a specimen of *Ambidexter swifti* off Palos Verdes. I recently was informed by Mary Wicksten that this was not a range extension from the original collection in Panama (as I stated) as she had reported the species from the Gulf of California (Wicksten 1983). I met with Mary at the Los Angeles County Museum of Natural History on the 19th of December, and she examined the specimen there. She found that I had erred in my identification, and the animal was *Processa peruviana* which she had described as a new species in the same paper. The present collection extends the range of that species north from the outer coast of Baja California into the Southern California Bight. The northern range limit of Ambidexter swifti remains at Isla San Benito, Gulf of California based on Mary Wicksten's record. - Don Cadien

E-MAIL COMMUNICATION

SCAMIT has been receiving communications via E-mail recently; in gradually increasing frequency . In addition to greetings, and orders for back issues of the Newsletter, we have had several notes from members concerning taxonomy. Member Roy Kropp (Batelle, Duxbury, Maine) sent an inquiry prompted by discussion in the newsletter of the isopod genus **Edotia** during SCBPP QA activities . I quote from his E-mail message "...After reading the newsletter about the two MEC provisional species and being reminded of the comments in Rafi and Laubitz regarding their material of **E. sublittoralis**, I would like to take a closer look at the Morro Bay material. Therefore, I was curious if there was any written information about the MEC species (e.g., voucher sheets) that I could use for a comparison.

Just for your interest, the **Edotia** situation on the east coast has been confused by many people. Starting with Wallace (~191) people synonymized **E. montosa** and **E. acuta** with **E. triloba**. After seeing much material from Mass Bay and Boston Harbor (and looking at the type of **E. acuta** in the USNM), I think **E. triloba** and **E. montosa** definitely are distinct and **E. acuta** is a synonym of **E. montosa**. Eric Lazo-Wasem and I are hoping to write this up (if we ever get time) soon. Also, I have looked at some material from the Gulf ...that has been called either **triloba** or **montosa** and think that it is different...and so the story goes."

I know of no sheets for either of the MEC provisionals, and hopefully some will be prepared soon. If anyone else has any information on local **Edotia** I am sure that Roy would be delighted to hear it. Contact him at kropp@battelle.org directly.



Edotia sublittoralis (from Rafi & Laubitz, 1990)

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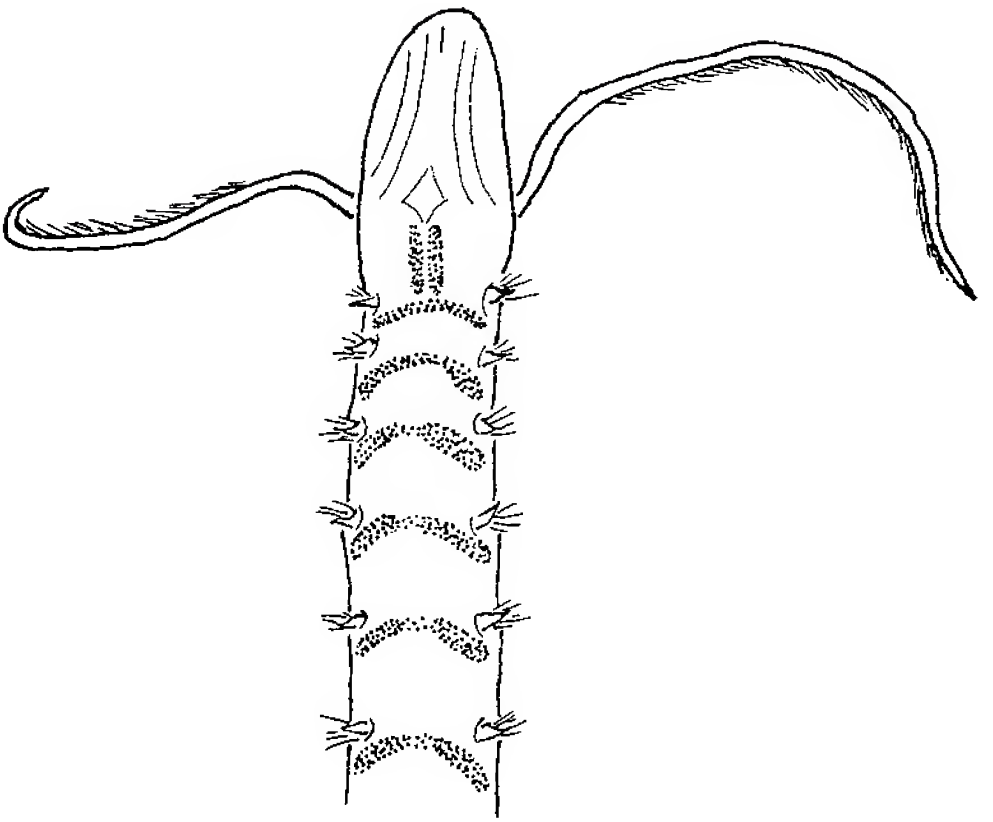
Collections Manager, Invertebrate Zoology

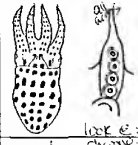
An immediate opening exists for a Collections Manager at the Natural History Museum of Los Angeles County. This is a permanent position funded by the Natural History Museum Foundation. The successful applicant will be responsible for the care and maintenance of the second largest collection of Crustacea in the United States. Responsibilities include supervision of volunteers, visiting researchers, and student workers; processing loans; and the successful completion of a current NSF grant for care of the collections. Applicants should have the MS degree or its equivalent in work experience at a major museum, as well as a strong background in invertebrate biology. Knowledge of relationships among the major groups of crustaceans is highly desirable. Starting salary is $30,500 / year. To apply, send curriculum vitae, names and addresses of three references, and letter of application outlining your qualifications, educational background and work history by January 16, 1996, to Dr. Joel W. Martin, Invertebrate Zoology, Natural History Museum of Los Angeles County, Los Angeles, CA 90007, USA. The Natural History Museum of Los Angeles County is an equal opportunity employer.

This illustration should have been included in the October SCAMIT Newsletter (Vol. 14, No. 6) with the information on staining patterns in polychaetes. The SCAMIT secretary apologizes for this omission.



Rose bengal staining pattern of *Magelona sacculata* Hartman,1961

KM Langan, Oct. 1995

Character	californicus	rubescens	veligero	selene
Funnel Organ				
Oviduct Shape				
Terminal Organ Shape				
Paralarvae	N/A			
Iridophores		gold (head to arms)	gold (head & arms)	gold (head & arms)
Radula				
Papillae				
Dark Spots	N/A			

SCAMIT CODE: None

Date Examined: 12 December 1995
Voucher By: Timothy Stebbins & Dean Pasko

SYNONYMY: Photis sp SD1 of Point Loma

LITERATURE: Barnard, J.L. 1962. Benthic marine Amphipoda of southern California: Families Aoridae, Photidae, Ischyroceridae, Corophiidae, Podoceridae. Pac. Nat., 3(1): 3-72.

Conlan, K.E. 1983. The amphipod superfamily Corophioidea in the northeastern Pacific region: 3. Family Isaeidae: Systematics and distributional ecology. Natl. Mus. Nat. Sci. (Canada) Publ. Nat. Sci., 4: 1-75.

DIAGNOSTIC CHARACTERS:

1. Female with distinct "male-type" gnathopod 2 (Figure 1A) consisting of a large emarginate palmer process with a denticulate margin. Gnathopod 1 slightly sinuous, almost transverse; dactyl overlapping palm.

2. Coxae weakly setose (< 10 setae along ventral margin). Coxa 2 completely overlaps coxa 1. Coxae 2 through 5 deep, with coxa 4 being the deepest: e.g., much longer than *Photis brevipes* and *P. californica*, but shorter than *Photis* sp A.

3. Eyelobe is acute.

4. Pigment pattern: body generally greyish white with light diffuse pigment anteriorly, most pronounced (as bands) dorsally on pereonites 1, 4 and 5, and on coxae 4 and 5..

RELATED SPECIES AND CHARACTER DIFFERENCES: None known.

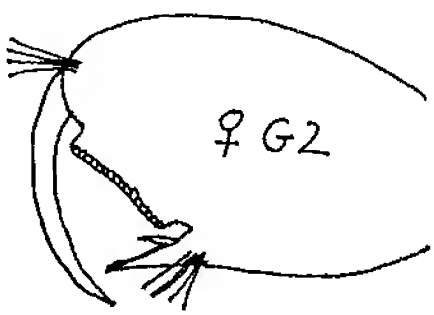
COMMENTS: Male unknown. Specimens examined = single gravid female approx. 3mm in length.

DEPTH RANGE: 138 m

DISTRIBUTION: Southern California Bight Pilot Project station #1916.

Figure 1. Photis sp. E: (A) gnathopod 2, lateral view; (B) gnathopod 1, lateral view.

A.



B.

Photis sp F SCAMIT 1995 SCAMIT Vol. 14, No. 8
Family: Isaeidae

SCAMIT CODE: None

Date Examined: 12 December 1995
Voucher By: Timothy Stebbins & Dean Pasko

SYNONYMY: *Photis* sp SD2 of Point Loma

LITERATURE: Barnard, J.L. 1962. Benthic marine Amphipoda of southern California: Families Aoridae, Photidae, Ischyroceridae, Corophiidae, Podoceridae. Pac. Nat., 3(1): 3-72.

Conlan, K.E. 1983. The amphipod superfamily Corophioidea in the northeastern Pacific region: 3. Family Isaeidae: Systematics and distributional ecology. Natl. Mus. Nat. Sci. (Canada) Publ. Nat. Sci., 4: 1-75.

DIAGNOSTIC CHARACTERS:

1. Male with distinct gnathopod 2 (Figure 1A) with a large flat palmer process and a large defining tooth; dactyl overlapping palm. Gnathopod 1 palm sinuous, almost "stepped", with posterior margin of article 6 equal to 1/2 the length of anterior margin.

2. Coxae weakly setose (< 10 setae along ventral margin). Coxa 1 with scalloped ventral margin. Posterior margins of coxae 1 and 2 strongly curved (i.e., not quadrate) (Figure 1C). Coxa 2 approximately 1/3 wider than deep (width to depth ratio=1.3). Coxa 3 has a quadrate ventral margin.

3. Eyelobe is not acute, though it is tappered.

4. Pigment pattern: body white, without pigment.

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. Male gnathopod 2 of *Photis* sp F is very similar to that of *Photis* sp B, but the eyelobe is not acute and gnathopod 1 is quite different.

COMMENTS: Female unknown.

DEPTH RANGE: 151 m

DISTRIBUTION: Southern California Bight Pilot Project station #1874.

Figure 1. Photis sp F: (A) gnathopod 2, lateral view; (B) gnathopod 1, lateral view; (C) coxae 1 - 3 (setae not included for coxae 2 & 3).

A. B. C.

SCAMIT CODE: None

Date Examined: 8 November 1995
Voucher By: Dean Pasko

SYNONYMY: Anopla sp. SD1 of CSDMWWD

LITERATURE: Coe, W. R., 1940. Revision of the nemertean fauna of the Pacific coasts of North, Central, and northern South America. Allan Hancock Pacific Expeditions. 2 No. 13: 247-323.

Blake, J. A. and A. L. Lissner, 1993. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. Volume 1. Introduction, Benthic Ecology, Oceanography, Platyhelminthes and Nemertea.

DIAGNOSTIC CHARACTERS:

1. Body somewhat elongatete, thick, tappered at both ends.
2. Color white without other markings.
3. Eyes absent.
4. Proboscis unarmed.
5. Cerebral ganglia large (dumbbell-shaped) .

RELATED SPECIES AND CHARACTER DIFFERENCES:

None known. At first glance this species has the general appearance of a Polyclad flatworm.

DEPTH RANGE: 90-120 m

DISTRIBUTION: Found off Point Loma, California in silty sediments at shelf depths.

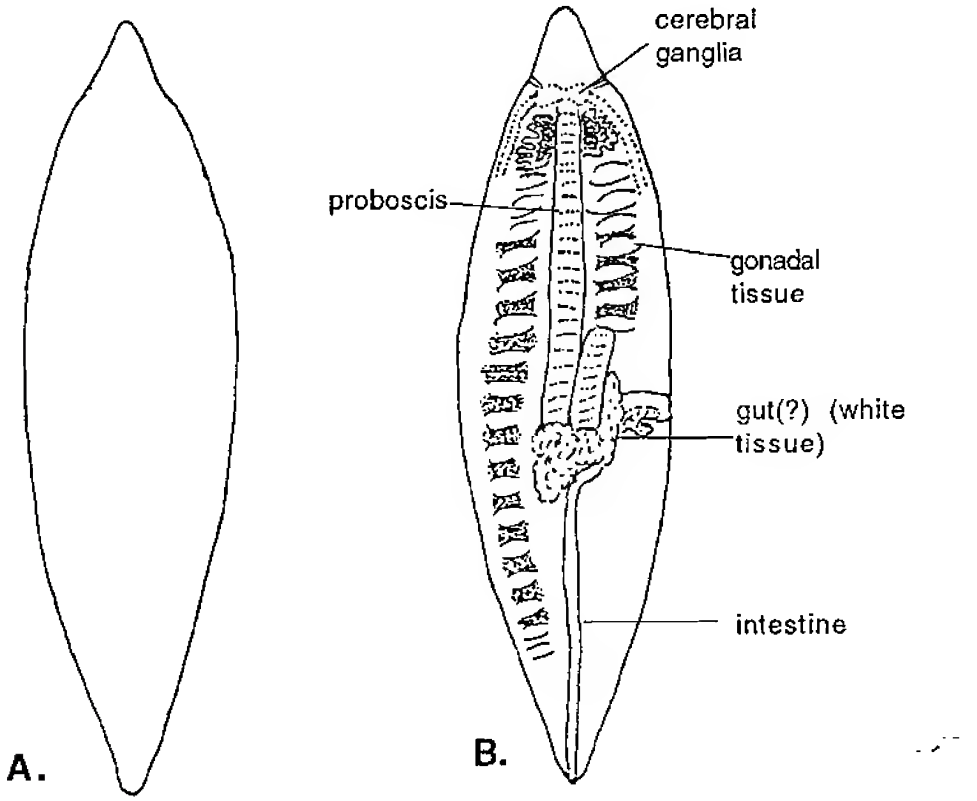


Figure 1. Anopla sp. B: **A.** whole animal, dorsal view; **B.** whole animal cleared, doral view.

SCAMIT CODE: None

Date Examined: 8 November 1995
Voucher By: Dean Pasko

SYNONYMY: Anopla sp. SD2 of CSDMWWD

LITERATURE: Coe, W. R., 1940. Revision of the nemertean fauna of the Pacific coasts of North, Central, and northern South America. Allan Hancock Pacific Expeditions. 2 No. 13: 247-323.

Blake, J. A. and A. L. Lissner, 1993. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. Volume 1. Introduction, Benthic Ecology, Oceanography, Platyhelminthes and Nemertea

DIAGNOSTIC CHARACTERS:

1. Body light colored (cream to tan or light olive), thin, elongate and thread-like.

2. Head somewhate elongate and rounded anteriorly.

3. Mouth modereatly seperated from proboscis pore.

4. White band present anteriorly, just anterior to mouth.

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. This species closely resembles Anopla sp. D SCAMIT in being an elongate, white, fairly featureless nemertean; however, Anopla sp. D has a mouth much separated from proboscis pore, a head that is tappered anteriorly, and a white body without a white band near the mouth.

DEPTH RANGE: 90-120 m

DISTRIBUTION: Found off Point Loma, California in silty sediments at shelf depths.

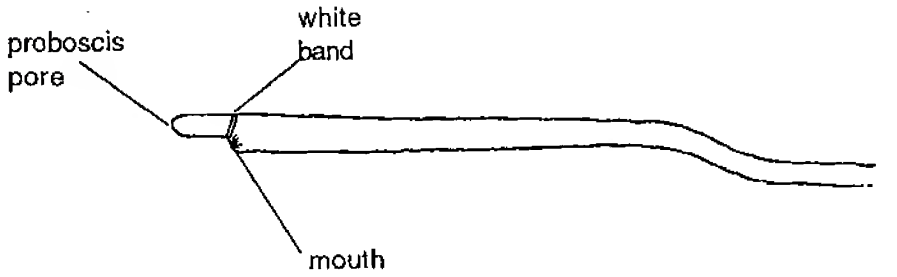


Figure 1. Anopla sp. C : **A.** anterior end, lateral view.

SCAMIT CODE: None

Date Examined: 8 November 1995
Voucher By: Dean Pasko

SYNONYMY: *Procephalothrix major* of CSDMWWD

LITERATURE: Bernhardt, P. 1979. A key to the nemertea from the intertidal zone of the coast of California. (Unpublished.)

Blake, J. A. and A. L. Lissner, 1993. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. Volume 1. Introduction, Benthic Ecology, Oceanography, Platyhelminthes and Nemertea.

Coe, W. R., 1940. Revision of the nemertean fauna of the Pacific coasts of North, Central, and northern South America. Allan Hancock Pacific Expeditions. 2 No. 13: 247-323.

DIAGNOSTIC CHARACTERS:

1. Body white, thin, elongate and thread-like, often coiled posteriorly
2. Head elongate and tappered anteriorly
3. Mouth seperated from proboscis pore by approximately 5 body widths
4. Eyes absent

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. This species resembles Anopla sp. C SCAMIT in being an elongate, white, fairly featureless nemertean; however, Anopla sp. C has a mouth much less separated from proboscis pore (approx. 2 body widths), a rounded head, a white band present just anterior to mouth, and a body generally cream to light olive in color.

DEPTH RANGE: 90-120 m

COMMENTS: This species closely resembles the illustration of *Procephalothrix spiralis* shown in Hyman, 1951, (Fig. 174, C & D) but with a more elongate mouth. It was originally identified as *Procephalothrix major* because the body was snarled or coiled posteriorly, not wrapped into a spiral as discribed in Bernhardt, 1979.

DISTRIBUTION: Found off Point Loma, California in silty sediments at shelf depths.

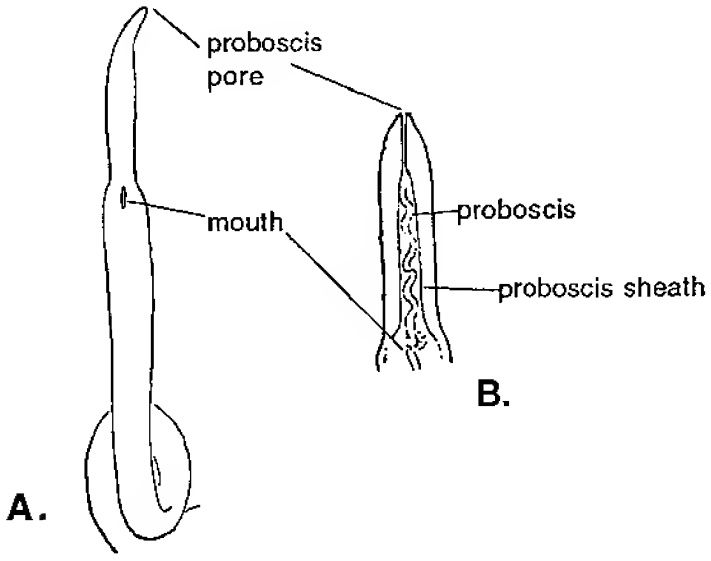


Figure 1. Anopla sp. D : **A.** anterior end, ventral view (from Hyman, 1951); **B.** anterior end, ventral view.

SCAMIT CODE: None

Date Examined: 27 October 1995
Voucher By: Dean Pasko

SYNONYMY: Polystylifera sp. SD 1 of CSDMWWD

LITERATURE: Coe, W. R., 1940. Revision of the nemertean fauna of the Pacific coasts of North, Central, and northern South America. Allan Hancock Pacific Expeditions. 2 No. 13: 247-323.

Gibson, R. 1982. Nemertea. In: Synopsis and Classification of Living Organisms. Vol. 1. PP: 823-846.

DIAGNOSTIC CHARACTERS:

1. Generally a large, thick bodied, dorso-ventrally flattened hoplonemertean with a large terminal proboscis pore. Body thickest in middle and tappering laterally to form ribbon-like lateral margins.

2. Color usually cream to light brown with mid-dorsal longitudinal band formed by fading of brown coloration laterally.

3. Eyes absent.

4. Cerebral ganglia large.

RELATED SPECIES AND CHARACTER DIFFERENCES:

An accurate affiliation of this species with described species (or higher taxa) is not possible at this time. The species superficially resembles a uniporian nemertean (Enopla: Hoplonemertea: Polystilifera: Uniporidae) because of the large atrium-like opening forming the proboscis pore, its large size, the appearance of a simple stomach lacking appendages, and the absence of eyes; however, the author's unfamiliarity with this group precludes assignment of this species to any lower taxon.

DEPTH RANGE: 60 m

DISTRIBUTION: Point Loma, California in sandy and silty sand sediments.

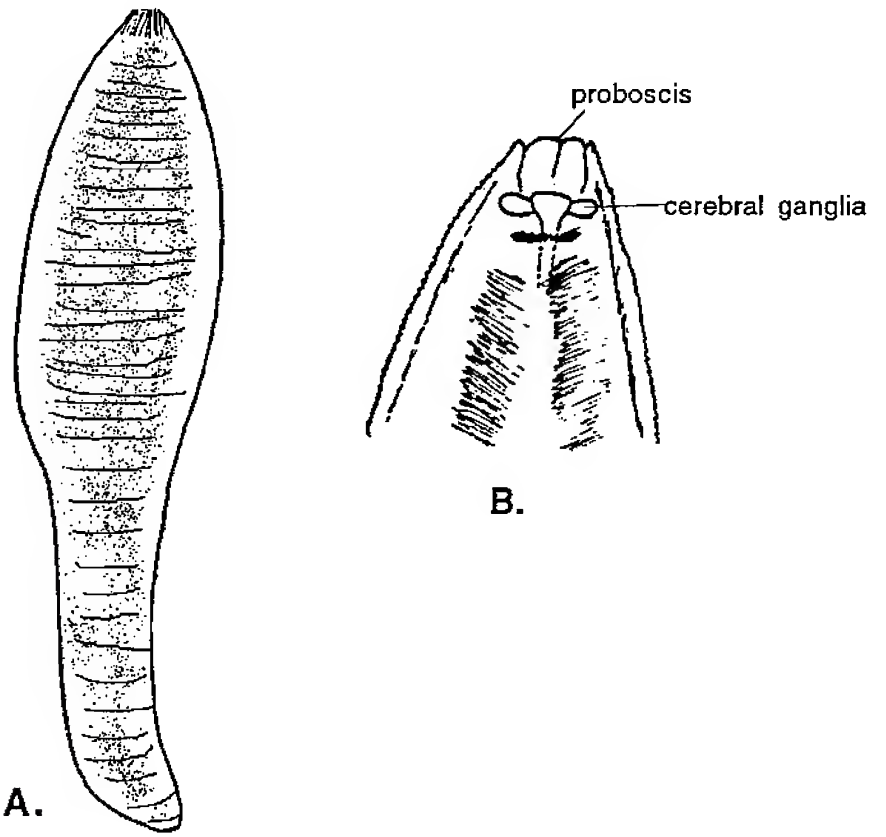


Figure 1. Enopla sp. A SCAMIT : **A.** whole animal, dorsal view; **B.** anterior end cleared, dorsal view.

Cryptonemertes actinophila (Bürger 1904) SCAMIT Vol. 14, No. 8
Group: Nemertea: Enopla: Hoplonemertea: Emplectonematidae

SCAMIT CODE: None

Date Examined: 27 October 1995
Voucher By: John Ljubenkov & Dean Pasko

SYNONYMY: Monostylifera sp. SD 2 of Point Loma (for SCBPP)

LITERATURE: Gibson, R. 1986. Redescription and taxonomic reappraisal of *Nemertopsis actinophila* Bürger, 1904 (Nemertea: Hoplonemertea: Monostilifera). Bulletin of Marine Science, 39(1): 42-60.

DIAGNOSTIC CHARACTERS:

1. Body generally elongate, thin, rounded anteriorly and tappered posterioirly; without pigment (white).

2. There are four eyes. The anteriormost are brick red, simple cup-shapped ocelli, much larger than posterior pair and fairly close set. The posterior eyes consist of irregular aggregations of pigment granules (frequently round in appearance) and are located alongside the cerebral ganglia. They are sometimes difficult to see, but are generally brick red, much smaller and more seperated than anterior pair, and fairly distant from the anterior pair.

3. Proboscis sheeth extends ~1/4 the length of body.

4. Proboscis armature consists of a long stylet (approx. equal to basis length) wth a cylindrical basis, and from 2-4 accessory pouches.

RELATED SPECIES AND CHARACTER DIFFERENCES:

DEPTH RANGE: intertidal to 150 m

DISTRIBUTION: Southern California Bight, frequently found in rocky substrates, and reported to live commensally among actinarians (hence the name "actinophila").

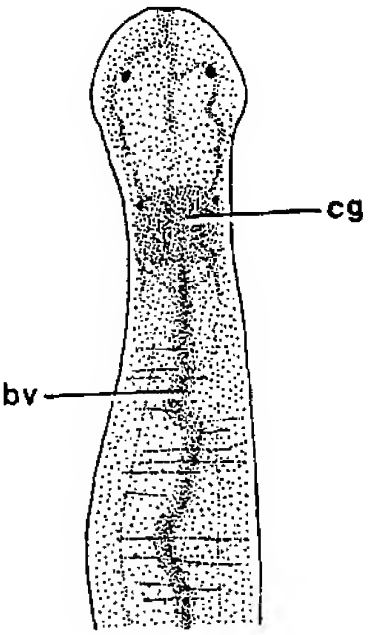


Figure 1

Figure 1. *Cryptonemertes actinophila*: **A.** anterior end, dorsal view (from Gibson, 1986).

SCAMIT CODE: None

Date Examined: 27 October 1995
Voucher By: Dean Pasko, J. Ljubenkov

SYNONYMY: *Prosorhochmus albidus* (Coe 1905) of MEC and CSDMWWD

LITERATURE: Coe, W. R. 1905. Nemerteans of the west and northwest coasts of America. Bulletin of the museum of Comparative Zoology, Harvard. 47: 1-318.

Bernhardt, P. 1979. A key to the nemertea from the intertidal zone of the coast of California. (Unpublished.)

DIAGNOSTIC CHARACTERS:

1. Body generally elongate, somewhat tapered posteriorly, without pigment (white) but with two triangular pigment patches dorsally on head. Head somewhat tapered anteriorly, set-off from the rest of body by a transverse cephalic slit, which arches anteriorly ("∩" shaped) on the ventral surface.

2. There are two pairs of eyes, both crescent shaped and red to rose colored.

3. Proboscis sheath extends ~3/4 the length of body.

4. Proboscis armature consists of a long stylet (approx. 2/3-3/4 the length of the basis) and a cylindrical basis with an expanded end. There are two accessory pouches with two stylets each.

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. This species is closely related to Monostylifera sp. C SCAMIT but differs from it by the presence of two pigment patches on the head, the presence of two pairs of eyes, and a longer proboscis sheath (~3/4 the length of body vs. $\leq$ 1/2 the length of the body in Monostylifera sp. C). The size and shape of the proboscis armature is very similar in both species.

1. This species is closely resembles *Prosorhochmus albidus* but differs from it in having well defined eyes that are not "large", "irregular" or with "rootlike processes of pigment extending on all sides" as described and figured in Bernhardt, 1979.

DEPTH RANGE: intertidal to 150 m

DISTRIBUTION: Southern California Bight.

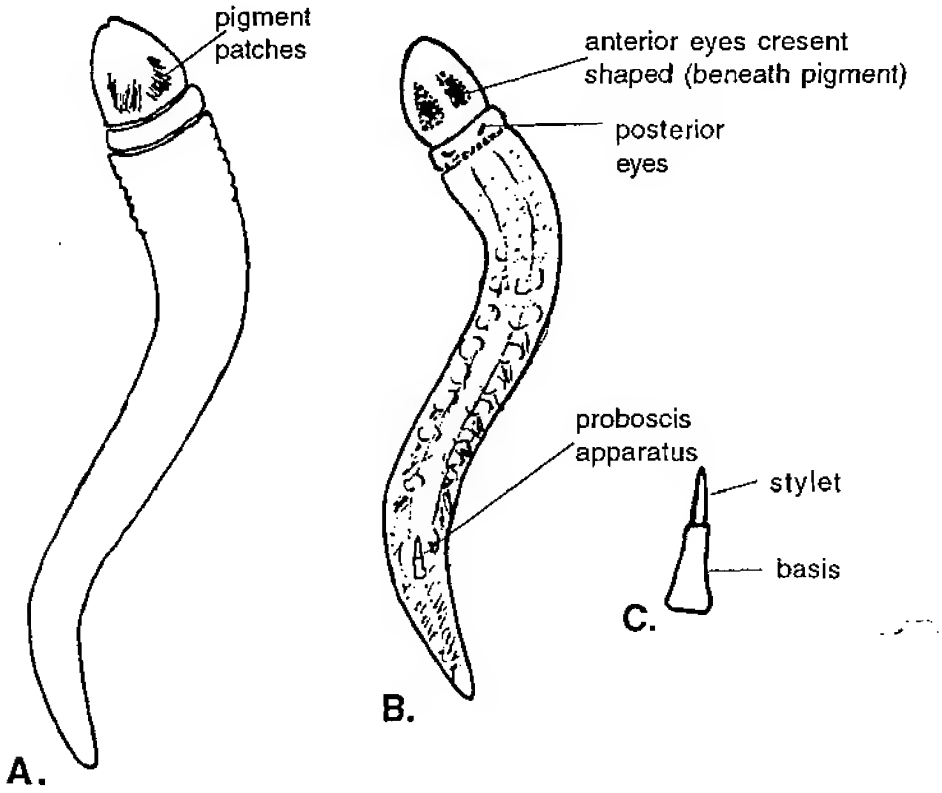


Figure 1. Monostylifera sp. B SCAMIT: **A.** entire animal, dorsal view; **B.** entire animal, cleared, dorsal view; **D.** proboscis armature.

SCAMIT CODE: None

Date Examined: 27 October 1995
Voucher By: Dean Pasko

SYNONYMY: Prosorhochmidae sp. SD 1 of CSDMWWD

LITERATURE: Coe, W. R. 1905. Nemerteans of the west and northwest coasts of America. Bulletin of the Museum of Comparative Zoology, Harvard. 47: 1-318.

Coe, W. R., 1940. Revision of the nemertean fauna of the Pacific coasts of North, Central, and northern South America. Allan Hancock Pacific Expeditions. 2 No. 13: 247-323.

DIAGNOSTIC CHARACTERS:

1. Body generally elongate, somewhat tapered posteriorly without pigment (white). Head somewhat tapered anteriorly, set-off from the rest of body by a transverse cephalic slit which arches anteriorly ("∩" shaped) on the ventral surface.

2. Ocelli absent (though hints of a single pair of anterior eyes were present in some specimens).

3. Proboscis sheath extends ~1/2-3/5 the length of body.

4. Proboscis armature consists of a long stylet (approx. 2/3-3/4 the length of the basis) and a cylindrical basis with an expanded end. There are two accessory stylet pouches with two stylets each. At 50x magnification, the stylets appear to have longitudinal lines or grooves. At 400x magnification, the stylets appear to be made of two layers: an outer transverse matrix and an inner granular core.

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. This species appears to be closely related to Monostylifera sp. B SCAMIT but differs from it in the absence of any head pigment and ocelli, and the shorter proboscis sheath ($\geq$ 3/4 the length of the body in Monostylifera sp. B). The size and shape of the proboscis armature is very similar in both species.

DEPTH RANGE: intertidal to 150 m

DISTRIBUTION: Southern California Bight.

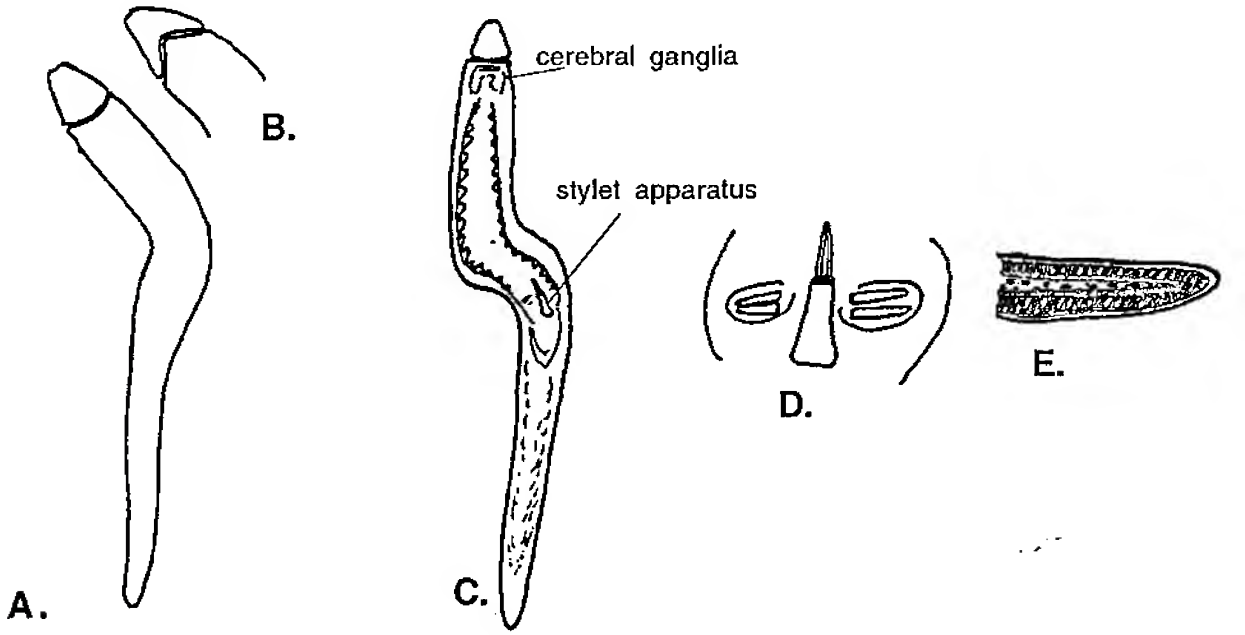


Figure 1. Monostylifera sp. C SCAMIT: **A.** entire animal, dorsal view; **B.** anterior end, ventral view; **C.** entire animal, cleared, dorsal view; **D.** proboscis armature, 100x; **E.** stylet, 400x.

SCAMIT CODE: None

Date Examined: 27 October 1995
Voucher By: Dean Pasko & Don Cadien

SYNONYMY: Paleonemertea sp. SD 1 of Point Loma
Paleonemertea sp. C of Cadien, LA County
Tubulanus sp. of Paquette, MBC

LITERATURE: Coe, W. R., 1940. Revision of the nemertean fauna of the Pacific coasts of North, Central, and northern South America. Allan Hancock Pacific Expeditions. 2 No. 13: 247-323.

Blake, J. A. and A. L. Lissner, 1993. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. Volume 1. Introduction, Benthic Ecology, Oceanography, Platyhelminthes and Nemertea.

DIAGNOSTIC CHARACTERS:

1. Generally a large, thick bodied "Tubulanid-type" nemertean with cream colored body and brownish-red preservation band in the esophageal region preceded by thin white preservation band anteriorly. Other variations on preserved pigmentation may include brownish speckling anteriorly on head and/or a thin white (isosceles) triangular patch posteriorly in preservation band (See Figure 1).

2. Lateral sense organ absent (i.e., paired lateral white rings typical of the lateral sense organs found in *Tubulanus polymorphus* are absent).

3. Eyes absent.

4. A very short longitudinal cephalic groove is present.

5 Just posterior to the cephalic groove, the head bears two flattened field--one of each side of the head--which are sharply defined, but not sunken below the body surface. These may be sensory.

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. *Tubulanus polymorphus*: cephalic groove absent and lateral sense organ present.

2. *Carinomella lactea*: cephalic groove absent; thin white band anterior to preservation ring also absent.
3. Paleonemertea sp. A of Phillips: cephalic groove absent; thin white band anterior to preservation ring absent; thin white band present on head in vicinity of mouth.

DEPTH RANGE: intertidal to 150 m

DISTRIBUTION: Southern California Bight.

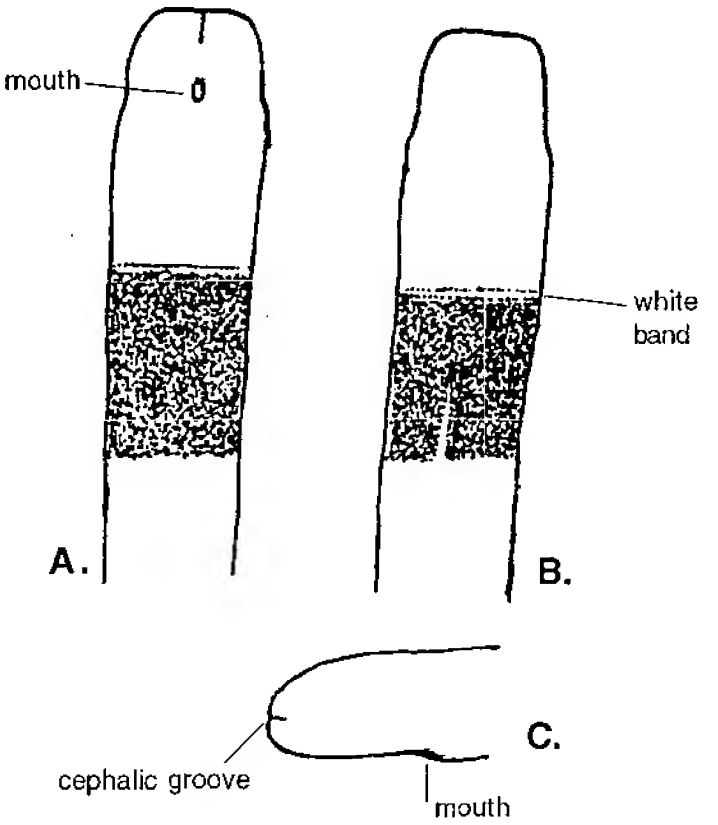


Figure 1

Figure 1. Paleonemertea sp. C SCAMIT: A. anterior end, ventral view; **B.**anterior end, dorsal view; **C.** head, lateral view.

SCAMIT CODE: None

Date Examined: 27 October 1995
Voucher By: John Ljubenkov & Dean Pasko

SYNONYMY: *Tetrastemma nr. candidum* of MEC and CSDMWWD

LITERATURE: Coe, W. R., 1940. Revision of the nemertean fauna of the Pacific coasts of North, Central, and northern South America. Allan Hancock Pacific Expeditions. 2 No. 13: 247-323.

Blake, J. A. and A. L. Lissner, 1993. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. Volume 1. Introduction, Benthic Ecology, Oceanography, Platyhelminthes and Nemertea.

DIAGNOSTIC CHARACTERS:

1. Body generally short, plump and without pigment (white).
2. Four crescent shaped rose-colored eyes with posterior pair facing posteriorly.
3. Proboscis sheath 2/3-3/4 the length of body.
4. Proboscis armature consists of short stylet ($\leq$1/5 of basis length) and cylindrical basis expanded and flattened posteriorly.

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. *Tetrastemma candidum*: Color gray, yellow, green or brownish green; stylet only slightly shorter than hourglass-shaped basis (cylindrical, constricted in middle, with round end) (See Figure 2).

DEPTH RANGE: intertidal to 150 m

DISTRIBUTION: Southern California Bight

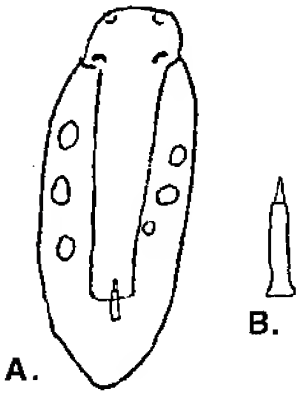


Figure 1

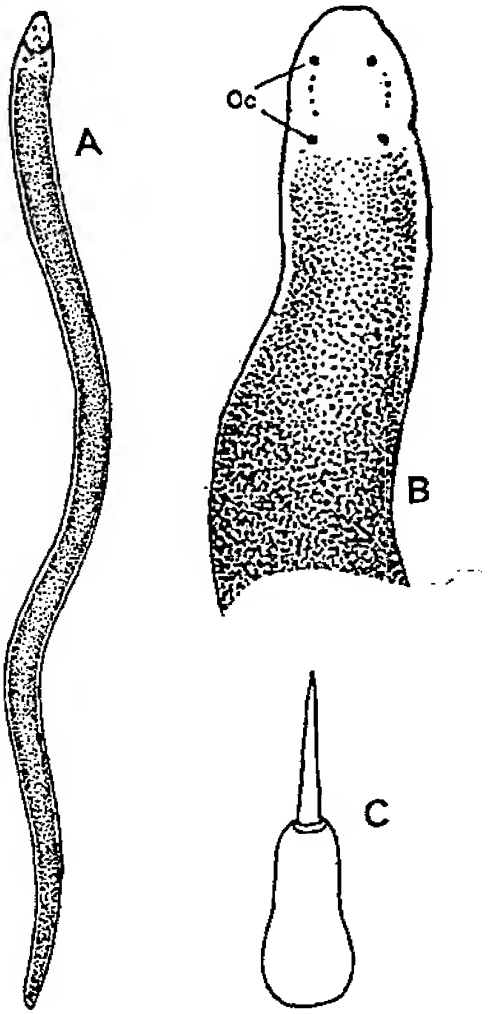


Figure 2

Figure 1. *Tetrastemma* sp. A SCAMIT: **A.** entire animal cleared; **B.** entire specimen, cleared; **C.** stylet apparatus.

Figure 2. *Tetrastemma candidum*: **A.** entire animal, dorsal view; **B.** anterior end, dorsal view; **C.** stylet apparatus. (From Blake and Lissner, 1993.)

SCAMIT CODE: None

Date Examined: 27 October 1995
Voucher By: Dean Pasko

SYNONYMY: Tubulanidae sp. SD1 CSDMWWD

LITERATURE: Coe, W. R., 1940. Revision of the nemertean fauna of the Pacific coasts of North, Central, and northern South America. Allan Hancock Pacific Expeditions. 2 No. 13: 247-323.

Blake, J. A. and A. L. Lissner, 1993. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. Volume 1. Introduction, Benthic Ecology, Oceanography, Platyhelminthes and Nemertea.

DIAGNOSTIC CHARACTERS:

1. Generally a large, thick bodied "Tubulanid-type" nemertean with dark, redish-brown colored body, with thin, light colored lateral line present; head cream colored.

2. Head set-off from body by distinct, fairly deep cephalic groove.

3. Eyes absent.

4. Lateral sense organ present as white (cream colored) lateral spot (one on each side).

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. Hoplonemertea sp. A of Ljubenkov: Pigment pattern very similar, but the proboscis pore and mouth are united.

COMMENTS:

Specimens have been collected with a thin, orange silt covered tube tightly adherent to the body.

DEPTH RANGE: 90 to 120 m

DISTRIBUTION: Point Loma, California in silty sediments along the shelf.

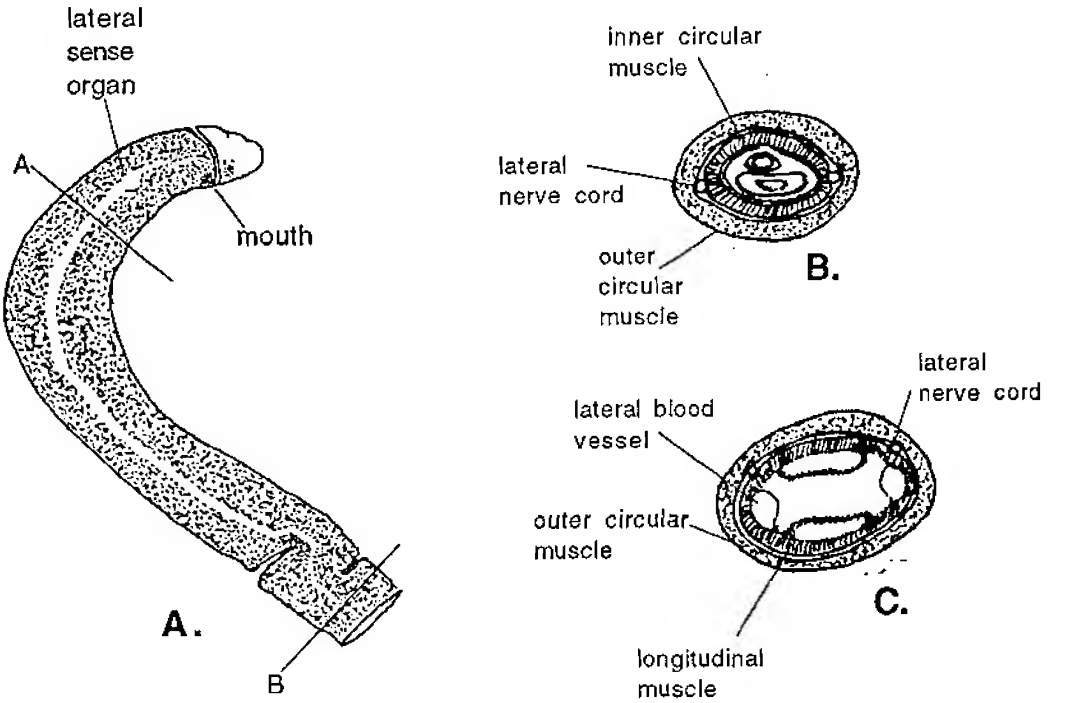
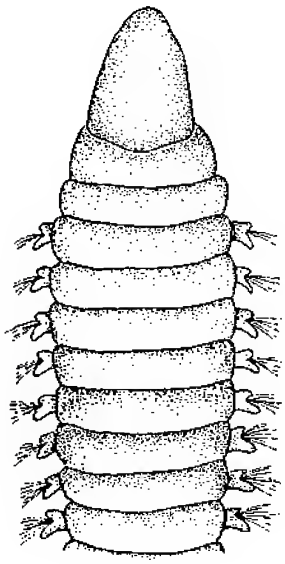


Figure 1. Tubulanidae sp. A : **A.** anterior end, lateral view; **B.** cross section through "A"; **C.** cross section through "B".

NEXT MEETING:	Lumbrineridae (except *Ninoe*)
GUEST SPEAKER:	Larry Lovell
DATE:	February 12, 1996
TIME:	9:30am - 3:30pm
LOCATION:	MEC 2433 Impala Drive Carlsbad, California



Lumbrineris cruzensis (ex Hilbig, 1995)

FEBRUARY 12 MEETING

The February meeting will be on polychaetes in the family Lumbrineridae (except *Ninoe*). The meeting will have Larry Lovell as guest speaker, and will be held at MEC in Carlsbad (see attached map). The emphasis in the meeting will be on identification of typical lumbrinerid specimens, rather than on complete specimens in excellent condition. Please bring your voucher specimens with you, along with the whole lumbrinerid fraction of one or more samples. We also plan to discuss sample handling and its impact on the identifiability of the resulting lumbrinerid specimens. A secondary goal is exchange of

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ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.
SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

experience with and opinion on the recently published Taxonomic Atlas second worm volume. Please be prepared to share any problems you have noted in this volume.

ELECTIONS

Nominations for SCAMIT officers for the 1996-97 year were made at the January meeting. All current SCAMIT officers were nominated again. No other nominations were received. Additional nominations would be welcome, please submit any to the Vice-President at the below address by the end of February, or at the February meeting. Candidate biographies have been included with this newsletter along with ballots that are due by the March meeting. If you will be unable to attend the March meeting please send your ballots to Don Cadien at LA County Sanitation Districts.

Don Cadien
Marine Biology Lab-JWPCP
24501 Figueroa St., Carson, CA, 90745

SPECIES LIST

A meeting was held on 19 January at SCCWRP to finalize additions and corrections to the first edition of the SCAMIT Taxonomic Listing of Benthic Invertebrates. The second edition will combine both trawl and benthic infaunal species records in a single listing. The final updates should be implemented shortly, and the new edition on its way to members within a month. We continue to welcome comment, correction, and addition to the listing. Materials received will be used in preparation of the next edition of the Taxonomic Listing. Send them to:

Dave Montagne
Marine Biology Laboratory
County Sanitation Districts
of Los Angeles County
24501 S. Figueroa Street
Carson, CA 90745
fax # (310) 834-7689
or
Ron Velarde
City of San Diego
Marine Biology Laboratory
4077 North Harbor Drive, MS 45A
San Diego, CA 92101
fax # (619) 692-4902

LITERATURE

Two new books on echinoderms are available, neither, unfortunately, concerning species from the northeastern Pacific. The first (1995. Sea Stars, Sea Urchins, and Allies - Echinoderms of Florida and the Caribbean) is by Dr. Gordon Hendler, Curator of Echinoderms at the Natural History Museum of Los Angeles County (and SCAMIT member), and deals with the identity and ecology of Caribbean echinoderms. Each of the covered species (those occurring shallower than 100 ft.) is diagnosed and illustrated. It can be obtained from Smithsonian Institution Press (see attached order form) for $39.95.

The second (Rowe & Gates 1996) provides the first comprehensive catalogue of information on the echinoderms of Australia since they were summarized by Clark in 1946. This is not a descriptive catalogue, and will not be of use for identification directly, but provides a summary of information available on each species. It is a section of the Zoological Catalogue of Australia, which will address the entire Australian fauna in about 90 volumes. Information on this and other portions of the series are available from CSIRO Information Services at:

PO Box 89, East Melbourne
Victoria 3002, Australia
or by
FAX: (03) 419 0459
or
email: bookshop@cis.csiro.au

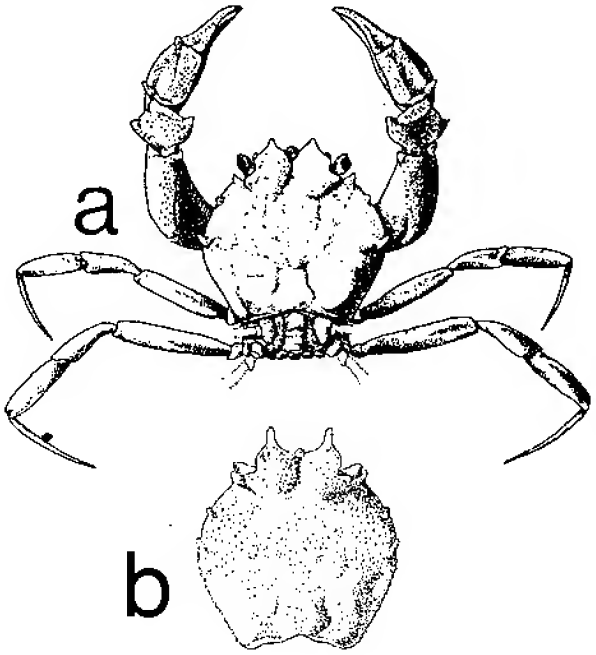
Another volume of the Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel has been published. Volume 13 - The Bryozoa was released at the end of December 1995. The authors, Dorothy and John Soule and Henry Chaney have contributed a major revisionary effort on the ectoproct fauna, drawing on several other collections as well as those taken from the MMS project that forms the basis of much of the series. They describe six new genera and 41 new species in the newly released volume. The schedule of expected release dates for the remaining volumes in the series is attached.

SECOND *Deilocerus* TAKEN

The small oxystomatous crab *Deilocerus planus* (known until recently as *Clythrocerus planus*) is familiar to those who sample shallow coarse substrates as part of their programs. Few are, however, aware that a second species in this genus occurs in the Southern California Bight. This species, *Deilocerus decorus,* is not listed in Schmitt's Decapods of California. It was not described until 1933, well after the publication of Schmitt's monograph. Despite this, the species is described and illustrated there - As *Cyclodorippe* sp? (Schmitt 1921, pg. 186-187, figure 115b).

It was not included in the decapod section of Straughan and Klink (1980) as the author of the section confined herself to the common species, and *D. decorus* is not common. She later (Wicksten 1988) reported on two lots from the California Academy of Sciences collections taken from 185m off Pt. Soberantes in Monterey County. No lots of this species are represented in the Natural History Museum of Los Angeles County collections, which include the Allan Hancock Foundation specimens (Gary Petit, pers. com.). It was covered in Rathbun's monograph on the oxystomatous crabs (1937), where records of three collections of single specimens were noted (the most recent in 1907). One of these records was from off Pt. Loma, where the species has recently been retaken. Several specimens (all at first identified as *D. planus*) have been found by the staff of the Pt. Loma lab from off Pt. Loma at depths of 100m+. The bottom at the stations where it occurs is relatively coarse, so the habitat is probably similar to that reported for *D. planus* in shallow water.

The two species are similar in size and shape, but *D. decorus* is more ornamented. Both are granulate or dentate along the side of the carapace, but *D. decorus* is more strongly so. The lateral carapace teeth of *D. decorus* are also granulate, while those of *D. planus* are smooth. The chelae and periopods of *D. decorus* bear strong granulations while those of *D. planus* are nearly smooth, and the periopodal propodi in *D. decorus* bear plumose setae lacking in *D. planus*.



Males of a.) *D. planus* and b.) *D. decorus* from Schmitt 1921

The frontal lobes of *D. decorus* are prolonged into digitiform processes, while those of *D. planus* are nearly triangular. Placement of the lateral carapace teeth relative to the post-orbital tooth also differs. In *D. planus* the anterior tooth is closer to the post-orbital than to the posterior tooth, while in *D. decorus* the reverse is true.

MINUTES FROM JANUARY 16

The sparsely attended meeting was held in the Times-Mirror room of the Natural History Museum of Los Angeles County. A review of the natural history of scaphopods was distributed at the meeting, along with an assessment of the status of the species listed as occurring on Pacific Coast of the United States in Turgeon et al. (1988). Comments provided by Shimek at the NAMIT meeting were also reviewed, and cited in some instances. We were, however, careful not to include data from his unpublished manuscript on the scaphopods to appear shortly in the Taxonomic Atlas series.

All of Shimek's commentary was pertinent to our more southern fauna, but several species we encounter here were not treated by him. Of particular interest were the definitions of genera he provided in his handout. These allowed us to see that the usage *Pulsellum aberrans* was incorrect based on the morphology mentioned in the generic definitions. In preparation for the meeting a handout was prepared which summarized some aspects of the biology and ecology of scaphopods, and provided summary discussion of the species reported from the Southern California Bight. A slightly modified version is attached.

Following an introductory discussion of the materials presented in the handout we examined a series of specimens selected from the collections of the NHMLAC mollusk collection. In some cases these lots were vouchers deposited by Shimek as vouchers of his species concepts. Species examined were *Antalis pretiosum, Dentalium vallicolens, Graptacme inversa, Graptacme semipolita, Rhabdus rectius, Gadila aberrans, Pulsellum salishorum, Polyschides californicus*, and *Polyschides tolmiei*.

It became clear during these identifications that the records of *Antalis pretiosum* and *Graptacme semipolita* from the Pt. Loma and LA County databases were based on incorrect concepts of the species. The specimens provided by Tony Phillips of *Graptacme semipolita* from Hyperion data were all very small, and inconclusive. Voucher lots of the two dentaliid species (*Rhabdus rectius* - LACO 57, SCCWRP 61; *Dentalium vallicolens* - MBC 33) examined at an earlier SCAMIT meeting were reexamined and their identity confirmed by comparison with museum materials, and the information provided by Shimek in his manuscript.

The dentaliids encountered by LA County and the Pt. Loma lab were either *Dentalium vallicolens* or *Rhabdus rectius*. More curved specimens of *R. rectius* had been interpreted as being *Graptacme semipolita* by LA County, and *D. vallicolens* had been identified as *G. semipolita* by Pt. Loma. Our specimen examinations indicated that the sculpture of *R. rectius* could easily be missed because it is very fine, very low, and the shell is usually transparent. We found that it was frequently necessary to use a tool to block the strongest light source, allowing more diffuse refracted light to pick out the faint longitudinal sculpture.

The same method helped to establish that the fine sculpture of *Dentalium vallicolens* usually extended for the full length of the shell (contrary to the illustration in Shimek's manuscript, which shows it extending only halfway down the shell). The sculpture of *Graptacme semipolita* was both coarser and stronger than that of the other two species, and none of the specimens brought by participants matched the lots examined from the Museum collection.

Examination of *Pulsellum salishorum* vouchered from Puget Sound by Shimek showed that none of the participants had encountered it in the Bight. Museum lots of the two gadilids *Polyschides californica* and *P. tolmiei* were examined. It was apparent that what was being recorded as *P. californicus* by LA County was actually *P. tolmiei*. The two species differ in their general shape, *P. californicus* being more slender than *P. tolmiei*, with a less prominent inflation of the shell prior to formation of the adult aperture. Even immature specimens should be separable based on inflation.

During examination of these materials it became evident that none of the available keys was adequate for separation of the species we encounter in all cases. Each (including the new key provided by Shimek in his MMS manuscript) is misleading or inaccurate to one extent or another. Once his key is published we will make attempts to emend it for use in the Southern California Bight, and at that time corrections or alternative approaches to particular couplets will be tried.

In the afternoon we adjourned to the Malacology Office on the third floor of the Museum for a visit with Dr. Jim McLean. He brought us up to date on the status of the MMS Atlas section dealing with gastropod mollusks, and allowed us to examine the manuscript. Although not all the families encountered in California waters are included, those families which are treated are handled completely. Materials for a reevaluation of the pyramidellids were strewn across several tables, and it appears that at long last the revision of at least the California members of that group is at hand. We can expect copious synonymy of earlier names, as well as descriptions of some new species. Dr. McLean has roughly 150 undescribed mollusk species from the Eastern Pacific in one cabinet. Descriptions of these are in various stages, but many will be included in the long awaited comprehensive monograph on west coast gastropod mollusks. The time line on this is now much shorter, with completion expected within just a few years. Fortunately the work done for the MMS Atlas volume will be at hand to facilitate the comprehensive monograph. With the Coan, Scott and Bernard bivalve monograph due out sometime in 1996, we will soon be enjoying a surfeit of new and authoritative source material on the taxonomy of our mollusk fauna.

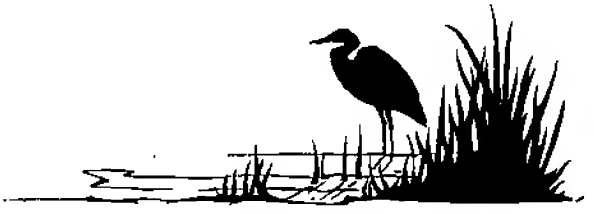
CORRECTION

It was recently noticed that there is a mistake in the *Boccardia* table that appeared in Vol. 13 (5) of the Newsletter in September 1994. The table notes that *Boccardia basilaria* Hartman 1961 is lacking notosetae on the first setiger. This is incorrect. *B. basilaria* does have notosetae present on the first setiger. Also, Blake and Woodwick (1971) have the same error in their table. In a later publication Blake (1986) redescribes *B. basilaria* while comparing it to a new species from the Galapagos Islands and mentions that setiger 1 is biramous. This is in keeping with Hartman's original description (1961) and her Atlas (1969). Although, her illustration of *B. basilaria* (1961) does not show the notosetae present on the first setiger she does mention (1969) that there are only a *few* setae present as compared with the more numerous neurosetal fascicle.

SCAMIT members using the *Boccardia* table may want to correct this mistake to avoid any possible confusion in the future. We believe this mistake was simply a typographical error, since this more recent table was based on Leslie Harris' older version where *B. basilaria* is correctly described, with notosetae present on setiger 1. Although, both the *Polydora* and *Boccardia* tables from Vol. 13 (5) were proofed several times before they were issued with the newsletter a few typos may still be present. Please alert the newsletter staff if any more are found so they may be corrected as soon as possible without creating any more confusion.

REQUEST FOR SPECIMENS

Ron Velarde has requested specimens of any encountered species in the polychaete Family Sphaerodoridae and in the turrid gastropod genus *Ophiodermella*. Ron is planning to report on the sphaerodorids, and perhaps also the turrid at a future meeting. Specimens should be brought to a SCAMIT meeting, or if meeting attendance is not possible contact Ron concerning specimen transfer.



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SCAMIT OFFICERS:

If you need any other information concerning SCAMIT please feel free to contact any of the officers.

President	Ron Velarde	(619)692-4903
Vice-President	Don Cadien	(310)830-2400 ext. 403
Secretary	Cheryl Brantley	(310)830-2400 ext. 403
Treasurer	Ann Dalkey	(310)648-5611

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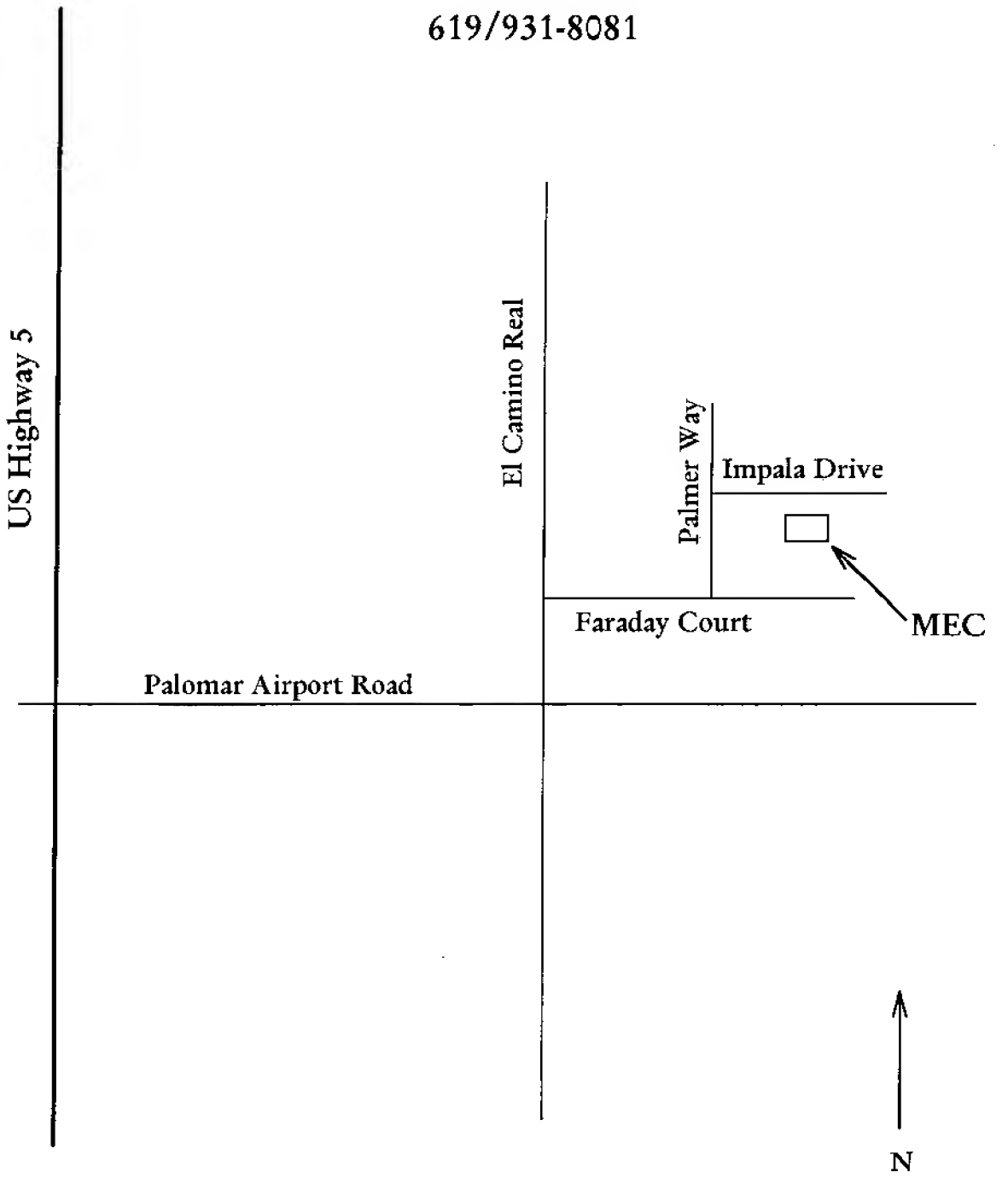
2433 Impala Drive
Carlsbad CA 92008
619/931-8081



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CANDIDATE BIOGRAPHIES

PRESIDENT

Ron Velarde

Ron is the current President of SCAMIT and a past Vice-President; he has been a Marine Biologist with the City of San Diego since 1983 and currently is the supervisor of Benthic Taxonomy for the Ocean Monitoring Program. His taxonomic interests include most groups, especially polychaetes and nudibranch mollusks. He earned his B.S. degree in Marine Biology from California State University, Long Beach, in 1976, and did post-graduate research on the systematics and ecology of autolytid polychaetes.

VICE-PRESIDENT

Don Cadien

Charter member of SCAMIT. Studied invertebrate taxonomy and biology at California State University, Long Beach, under Dr. D. J. Reish. Worked at Cabrillo Marine Museum, then at the L.A. County Museum of Natural History under Dr. J. H. McLean in Malacology. Spent 15 years at M.B.C. Applied Environmental Sciences as a taxonomist and later also Project Manager, leaving in 1989 as a Senior Marine Biologist to join the L.A. County Sanitation Districts' Marine Biology Lab. Specialties in taxonomy and biology of mollusks (particularly nudibranchs) and peracarid crustaceans. Currently a Research Associate in the Crustacea Section of the L.A. County Museum of Natural History.

SECRETARY

Cheryl Brantley

Cheryl is the current Secretary of SCAMIT and a marine biologist for the County Sanitation Districts of Los Angeles County. She has worked for the Districts since graduation with her B.A. degree in Aquatic Biology from the University of California, Santa Barbara in 1985. As a taxonomist in the Districts' Marine Biology Laboratory, Cheryl has specialized in polychaetes with emphasis on the Spionida, Eunicida and the Aphroditiformia.

TREASURER

Ann Dalkey

Ann is presently the Treasurer for SCAMIT and has held this position since SCAMIT was founded. Ann is a member of the water biology staff at the Hyperion Treatment Plant where she specializes in the identification of polychaetes and amphipod crustaceans. Prior to working at Hyperion, Ann was a member of the laboratory staff at the County Sanitation Districts of Orange County. She worked there for nearly 10 years, reaching a position of senior laboratory and research analyst. She received her B.S. from California State University Long Beach in Marine Biology in 1974 and her M.S. from the same university in 1982. Her thesis research pertained to polychaete bioassay.

BALLOT FOR SCAMIT OFFICERS 1996-97

Vote for one (1) nominee for each office. Please mail or return completed ballot to Don Cadien by March 31, 1996. You may return it to the Secretary or other attending officer at the March 11 meeting. The address to mail it to is:

Don Cadien
Marine Biology Laboratory
County Sanitation Districts
of Los Angeles County
24501 S. Figueroa Street
Carson, CA 90745

President - The president presides at all meetings and represents SCAMIT in external business affairs.

_____ Ron Velarde

_____ Write-in:_____

Vice-President - The Vice-President chairs ad hoc committees, supervises the specimen exchange, tabulates election ballots, edits the newsletter, and fills in for the President as necessary.

_____ Don Cadien

_____ Write-in:_____

Secretary - The Secretary keeps minutes of the meetings, is responsible for the newsletter, and preparation of the ballots.

_____ Cheryl Brantley

_____ Write-in:_____

Treasurer - The Treasurer collects dues, makes disbursements, keeps financial records, and makes an annual statement of the financial status of SCAMIT.

_____ Ann Dalkey

_____ Write-in:_____

1996-97 SCAMIT Meeting Topics - Please suggest any topics you deem worthy of a SCAMIT meeting.

_____

_____

Santa Barbara Museum of Natural History

Taxonomic Atlas

List of volumes and authors to be published in 1995 - 1996

Volume 3 - The Cnidaria (anticipated publication date - May 1996)

Daphne G. Fautin, University of Kansas
F. G. Hochberg, Santa Barbara Museum

Volume 6 - Polychaeta, Part 3 (anticipated publication date - March 1996)

James Blake, Science Applications International Corp.
Brigette Hilbig, Science Applications International Corp.

Volume 7 - Polychaeta, Part 4 (anticipated publication date - May 1996)

James Blake, Science Applications International Corp.
Brigette Hilbig, Science Applications International Corp.
William J. Light, Colorado Springs
R. Eugene Ruff, Ruff Systematics

Volume 8 - The Mollusca, Part 1 (anticipated publication date - March 1996)

Douglas Eernisse, California State University, Fullerton
F. G. Hochberg, Santa Barbara Museum
Amelie Scheltema, Woods Hole Oceanographic Institution
Paul Scott, Santa Barbara Museum of Natural History
Ron Shimek, Montana State University

Volume 9 - The Mollusca, Part 2 (anticipated publication date - 30 December 1995)

James McLean, Natural History Museum of Los Angeles County
Terrance Gosliner, California Academy of Sciences

Volume 10 - The Crustacea, Part 1 (anticipated publication date - February 1996)

Joel Martin, Natural History Museum of Los Angeles County
Donald Cadien, Los Angeles County Sanitation District
Isabella Williams, ENSR Consulting and Engineering

Volume 11 - The Crustacea, Part 2 (anticipated publication date - April 1996)

George Wilson, Australian Museum, Sydney
Richard Brusca, University of South Carolina
Masahiro Dojiri, City of Los Angeles
Les Watling, Darling Marine Center, Maine

Volume 13 - The Bryozoa (anticipated publication date - 20 December 1995)

Dorthy Soule, University of Southern California
John Soule, University of Southern California
Henry Chaney, Santa Barbara Museum of Natual History

Volume 14 - Miscellaneous taxa (anticipated publication date - June 1996)

Keith Woodwick, California State University Fresno (enteropneusts)
F. G. Hochberg, Santa Barbara Museum (brachiopods)
John Pilger, Agnes Scott College (echiurans)
Paula Winchell, Science Applications International Corp.
Mary Bergen, Sacramento, California (holothuroids)
Gordon Hendler, Natural History Museum of Los Angeles County (ophiuriods)
Andew Lissner, Science Applications International, Corp. (asteroids & echinoids)
Gretchen Lambert, California State University Fullerton (ascidians)

SCAPHOPODA

Donald B. Cadien - CSDLAC 16 January 1996

The scaphopod fauna of the northeastern Pacific has been underexamined. Much of the species level taxonomy is based on Pilsbry and Sharp (1897-98), which, while very well done, is nearly a century old. Dr. Ron Shimek (now at Montana State University) has been involved in a reexamination of this fauna, especially that portion of it to the north of California. He made a presentation at the most recent NAMIT workshop which summarized the state of present knowledge and incorporated both recent changes and changes which will be introduced with the publication of his Scaphopod section of the Santa Maria Basin Taxonomic Atlas series (probably within just a few months). His presentation, as reported on by Kelvin Barwick, prompted this reexamination of the current status of taxa reported to occur in the North East Pacific region. The listing provided in Turgeon et. al. (1988) was used as the basis for the scaphopod portion of the SCAMIT Taxonomic Listing (edition 1). Taxa they list as from the Pacific are extracted and presented below in the same hierarchical groupings used by Turgeon et. al. (op. cit.) - [*= recorded by SCAMIT member agency]

Order Dentaliida
- Family Dentaliidae
  - Antalis berryi (A.G. Smith & Gordon, 1948)
  - Antalis pretiosum (Sowerby, 1860)*
  - Dentalium agassizi Pilsbry and Sharp, 1897
  - Dentalium neohexagonum Sharp and Pilsbry, 1897*
  - Dentalium vallicolens Raymond, 1904*
  - Fissidentalium megathyris (Dall, 1890)
  - Graptacme inversa (Deshayes, 1826)
  - Graptacme semipolita (Broderip & Sowerby, 1829)*
- Family Laevidentaliidae
  - Rhabdus dalli (Pilsbry and Sharp, 1897)
  - Rhabdus rectius (Carpenter, 1865)*
  - Rhabdus watsoni (Sharp and Pilsbry, 1897)*

Order Gadilida
- Family Pulsellidae
  - Pulsellum aberrans (Whiteaves, 1887)*
  - Pulsellum salishorum E. Marshall, 1980
- Family Siphonodentaliidae
  - Polyschides californicus (Pilsbry and Sharp, 1898)*
  - Polyschides tolmiei (Dall, 1897)*
  - Siphonodentalium quadrifissatum (Pilsbry and Sharp, 1898)*
- Family Gadilidae
  - Gadila fusiformis Pilsbry and Sharp, 1898
  - Gadila hepburni (Dall, 1897)

The only relatively complete earlier treatment of the group in our area is that of John Q. Burch in the Minutes of the Conchological Club of Southern California from 1945. Scaphopods had been included in Oldroyd's The Marine Shells of the West Coast of North America (1927), but the coverage was relatively uninformative, and the illustrations meager. Slightly later Grant and Gale (1931 - Catalogue of the marine Pliocene and Pleistocene Mollusca of California and adjacent regions) provided some additional information beyond the original descriptions, but added no illustrations of the species. A number of our local species were illustrated and briefly described in Seashells of Tropical West America (Keen, 1958[2nd edition 1971], or American Seashells (Abbott, 1954[2nd edition 1974]). None of these provide the depth of information and breadth of illustration of Burch's 1945 effort.

Problems with Scaphopod Identification

The nature of tusk shells, particularly dentaliids but also juvenile gadilids, leads to problems for taxonomists. The basic difficulty is that there are relatively few non-anatomical characters to use in species differentiation. Steiner (1992), in his phyletic analysis of the scaphopods, had only four of 28 characters derived from the shell. The shell is shaped similarly in all members of the class; an elongate tube open at both ends. Some species can have shells with surface sculpture at some or all periods of their development. Seemingly distinctive apertural modifications (slits or notches) are present in some or all members of some species. These may be useful to differentiate species, but are often found to vary with degree of maturity, and even within an age group. Shimek maintains in the NAMIT notes that a selection of derived metrics can be used to precisely define the shape of the shell on a species specific basis. These metrics, however, are only reliable on unbroken adult shells, a relatively small subset of our monitoring specimens.

Tusk shells grow longer by addition of shell at the edge of the anterior aperture, and they are also either thickened or thinned by actions of the mantle over the length of the shell. In some species the posterior end of the shell, whose aperture becomes increasingly tight as the mollusk grows, is intentionally resorbed and/or decollated to provide a more "fitting" habitation (Reynolds, 1992). Such loss of the thin juvenile end of the shell leads to proportional change in it's length/diameter ratio, loss of the characters of the juvenile shell sculpture (either smooth, finely striate, coarsely striate, ribbed, etc.), and often a severe alteration of it's overall gestalt. In many species there is also a slight but perceptible difference of curvature in the juvenile and adult portions of the shell. If the juvenile tip is accidentally broken off or intentionally decollated the resulting tusk shell is very different in appearance from that preceding the breakage.

This problem has been commented on with regard to identification by Burch, who made observations on the differences between *Dentalium* (now *Rhabdus*) *rectius* and *watsoni* (Burch, 1945). I quote from his discussion..."...the longest specimens from either set will fit the described measurements of *watsoni* (16-19 times the diameter) but if you break off one of the long specimens at the right spot you then have the measurements of *rectius* (12-15.5 times the diameter). Young [or broken] specimens measure *rectius* and the older ones *watsoni*." This condition is a result of growth allometry. At a certain stage of maturity increase in shell diameter ceases or is greatly reduced in rate while growth continues as shell elongation. Any species with this type of growth allometry can

easily present the appearance of two or more species depending on the retention or decollation of the juvenile shell. Other dentaliid species seem to retain the relationship between growth in diameter and growth in length throughout their lives. These are fairly immune to misidentification through loss of the juvenile shell.

A further complication related to growth is found in members of the dentaliid families Laevidentaliidae and Gadilinidae, and specifically in the genera *Rhabdus* and *Episiphon*. Members of these genera appear to resorb or decollate the juvenile shell, then replace it with a newly constructed narrow tube extending the posterior aperture (Reynolds, 1992). This new tube is not sculptured, and the species may not key properly if the new apertural extension tube is interpreted as the juvenile shell.

In gadilids, where the mature aperture is narrower than that of the juvenile, the problems in identification caused by specimen immaturity are also severe. Since the identification can often hinge on the position of the greatest shell diameter relative to the aperture, immature shells in which this greatest diameter is not yet formed are not easily assigned to species. Other shell characters such as shell thickness, color, or surface sculpture may or may not help with such juveniles. In some cases it may be necessary to note that adults of only one species are found in the sampling area, allowing the deduction that co-occurring juveniles belong to the same species. In areas where more than one species is present, the juveniles should probably remain at generic (or family) level.

SCAPHOPOD BIOLOGY

Trophic relations - prey and predators

Most species investigated to date appear to be selective predatory deposit-feeders. Predatory because the particles they selectively ingest are foraminifera. Alternatively they can be considered carnivores (Bilyard 1974) despite the location of the prey within the sediments. Shimek (1989) reports that some species of forams are preferred, and are consumed selectively, while others are generally avoided, and some species consumed as encountered. These three categories correspond to presence in guts at greater, less, or equal proportion to their availability in the surrounding sediments. In a few cases (Steiner 1994) deep water scaphopods appear to intentionally ingest sediments along with foraminifera, while guts of most scaphopods contain at least some sediment. These deep-water species have more elongate guts which are fully packed with sediment, probably in response to the more diffuse food resources of deep-sea sediments. They seem to be neither selective predators nor non-selective deposit-feeders, but to fit into an intermediate "opportunistically selective" category which allows use of a wider resource spectrum.

Direct observation (Shimek 1988) of *Rhabdus rectius*, combined with examination of patterns of cilia on the captacula with electron microscopy help to explain this type of scaphopod feeding behavior. His investigations demonstrated that *R. rectius* was primarily a non-selective deposit feeder, which would also selectively ingest foraminifera where they were available. This ability was based on the presence of a well developed continuous ciliated tract along each captaculum allowing conveyor belt movement of fine particulates up the captacular stalk into the

mantle cavity where they were collected and passed to the mouth by other captacula. The lack of crushing of ingested foraminifera by *R. rectius* may be an indication that deposit feeding is indeed the primary feeding mode of the species, with the consumption of the occasional packet of organic material (foram) only an energetic bonus.

Known predators of scaphopods are few, but damage to shells is relatively common (Kropp, 1992). These reports are borne out by experience with local environmental samples. Many of the scaphopods taken in such samples show evidence of shell breakage and repair, presumably from a survived predation attempt. Shimek reports (1989) predation by rat-fish *Hydrolagus colliei* on several species of scaphopods. One sand-star *Astropecten verrilli*, which feeds on mollusks, was observed with a large dentaliid sticking out of the gut through the dorsum of the star (Cadien, pers. obs.), and it is assumed that smaller forms such as *Gadila aberrans* and *Siphonodentalium quadrifissatum* (which occur in the same habitat) would also be acceptable prey.

Life position and burrowing

Scaphopods are burrowers. They live either partially or entirely below the surface of the sediments with their anterior end below their posterior end (Gainey, 1972) . This is not to imply that they are in a vertical position. This may be true for some species, but the majority of species probably are angled through the sediment. Gainey suggests that their ability to burrow upward (which he observed) allows repositioning the shell for various angled downward feeding excursions into the sediment, the angle being determined by the location of the feeding stratum relative to the length of the animal. Like other selective deposit feeders they construct a feeding excavation or pit within which their specialized food gathering structures can function. In scaphopods these structures are the captacula, extensible tentacle-like filaments arising near the foot which manipulate particles, capture selected prey, and convey them to the mouth. The feeding excavation is roughly the size of the expanded foot, and is created by the foot probing into and compacting the sediments at the front of the shell (Yonge & Thompson 1976). This excavation is enlarged by the captacula, which may pull material from the roof of the cavity for examination on the floor (Gainey, 1974).

Shimek (1989) reports observations on living *Gadila aberrans* in aquaria where they seldom contact the sediment surface, preferring to stay at least 6-8cm and often up to 30cm below the surface. These animals were fast and agile diggers, moving through the sediments at rates up to 1 cm/sec. It is likely that other smooth, lightly shelled forms such as this are also rapid burrowers. Larger shelled species such as *Antalis pretiosum* or *Dentalium vallicolens* are more likely to be less active burrowers, and to have more frequent contact with the sediment surface.

These observations partially contradict earlier assessments such as those of Yonge and Thompson (1976) who state "..these tusk shells do not penetrate to any depth; the narrow end must always project above the surface." This is apparently not true for at least some species of dentaliids, and is probably not true for most gadilids. Yet it does hold for some local dentaliids. Observations on *Antalis pretiosum* from a submersible in Puget Sound (Nuytten, 1993) showed a number of the posterior shell ends protruding from the sediment to be covered with red algae, demonstrating that these ends were seldom (if ever) pulled beneath the sediment surface.

TAXONOMY OF LOCAL SPECIES

Dr. Shimek was kind enough to distribute copies of his upcoming section of the Santa Maria Basin Taxonomic Atlas at the recent NAMIT mollusk workshop. He was also careful in indicating that this was a prepublication draft, and should not be cited prior to it's publication. We will honor this by not discussing new materials or opinions introduced in the draft here. There are, however, several other sources of information which we can utilize to reevaluate the status of west coast scaphopod taxonomy. There appear to be several species which appear on the AFS scaphopod listing which are no longer valid, or require reallocation to other genera or families. The preparation of the AFS list was by leading workers (Emerson, McFadien, and Kraeuter) and choices made there (elevation of *Cadulus* and *Dentalium* subgenera to full generic status for instance) were not arbitrary. The genera and higher level taxa are briefly diagnosed in Moore (1960), and additional information on genera and subgenera is provided by Emerson (1952, and 1962).

Antalis berryi

Described from Monterey Bay, this is viewed as a southern subspecies of *A. pretiosum* by Abbott (1974). All specimens in the museum collection so identified bore a secondary hand written identification of a manuscript name. The status of the species remains unclear.

Antalis pretiosum

This is the northeast Pacific wampum shell harvested from Puget Sound by several indian tribes. This process was well described recently (Nuytten, 1993). The shells are large, thick, opaque white, and lack longitudinal sculpture. They do have intermittent annular swellings, but are essentially unscuptured.

Dentalium agassizi

A form with even numerous ribs running the length of the shell. It occurs in waters deeper than those normally sampled in monitoring programs, between 800-1600m according to Burch (1945), and from the California channel islands south to Panama.

Dentalium neohexagonum

The only dentaliid occurring in shallow inshore sandy bottoms in the Bight. All other dentaliid species in the area favor off-shore habitats with higher proportions of silt and or clay. It is also the only angular scaphopod to be taken in our area (shell nearly hexagonal in cross section with flattened sides).

Dentalium vallicolens

A large robust species strongly associated with the presence of relatively coarse sediments (relict sands and/or shelly debris) on the mid to outer shelf. The shell is thicker than that of *Rhabdus rectius*, and similar in thickness to that of *Graptacme semipolita*. The shell is finely ribbed, a condition which persists in the adult, with the ribs usually extending the full length of the adult shell. Care must be exercised in searching for ribs, they can often be seen only with the use of oblique illumination, which is caught by the ribs, but not the shell surface itself, making the ribs stand out more clearly from the background of the shell.

Fissidentalium erosum

A very deep water species (1000+ meters) not occurring in the Bight. It occurs in mixed populations with the next species, and was recently described (Shimek and Moreno, 1996). It can only be separated from *F. megathyris* by the more eroded shell, and by morphometrics of the body regions.

Fissidentalium megathyris

A very deep water species which does not occur at depths sampled in Bight programs, although it may range into our geographic area. Should a shell of this animal be translocated into our sampling depths (by a hermit crab, for instance), it would be immediately recognizable by the very strong and numerous longitudinal ribs which crowd it's surface.

Graptacme inversa

Burch (1945) notes this as very similar to *semipolita*, but differing in the placement of the apertural slit to the side of the median line of the shell apex. It may prove to be only a variant of the next species.

Graptacme semipolita

The shell is of moderate size, but not particularly thin, translucent to nearly opaque white, and usually prominantly ribbed on the juvenile portion of the shell. The species is more strongly curved than *Rhabdus rectius* and about equal in curvature to *Dentalium vallicolens* of equal length. It increases in diameter more rapidly than *R. rectius*, and is much more strongly ribbed than *D. vallicolens*. *Dentalium hannai* Baker 1925 is a synonym (Burch 1945) which differs only in possession of an apertural slit not seen in *semipolita*. Burch found the two "species living together off Redondo Beach.

[*Rhabdus dalli*]

A third species, which combined with the two following species, forms a continuum of change with growth. As discussed by Burch(1945) - see above under "Problems in Scaphopod Identification"- changes in the length/diameter ratio can be obtained by decollation of the juvenile portion of the shell. This is the largest of the three "species", with a length 11-14 times the diameter. It is very likely to be a synonym of *R. rectius*.

Rhabdus rectius

Both the preceding and following species bracket this one in length/diameter ratio. All three have at most an inconspicuous apical notch dorsally, all are very slightly curved, and lack sculpture. This name has priority. All three species, although maintained (conservatively) on the AFS list, should be combined under Carpenter's species *rectius*. It can be distinguished from *Graptacme semipolita* by the much straighter shell, by the smaller diameter at any given length, and by it's near glassy transparency (especially in smaller specimens). *Dentalium vallicolens* differs from *R. rectius* in being much thickly shelled, larger in diameter at every length, slightly more curved, and more strongly ribbed on the shell.

[*Rhabdus watsoni*]

Burch presented evidence that this species was probably synonymous with the previous one, but then backed away from formally establishing the synonymy. No evidence of their separation has come forward in the intervening 50 years, and they should be combined. Abbott (1974) treated *R. watsoni* as a synonym of *R. rectius*.

Compressidens stearnsii

Reported at between 80-200m depths off Santa Monica Bay and Palos Verdes by Burch (1945), this is a species I have not seen. It should be easily recognizable because of the dorso-ventral flattening characteristic of the genus, producing a flattened oval aperture.

Pulsellum aberrans (=***Gadila aberrans***)

It was clear from the examination of shell material by Shimek (1989) that four nominate *Cadulus* species were the same: *C. aberrans*, *C. fusiformis*, *C. hepburni*, and *C. nitentior*; with *C. aberrans* having priority, and the other three being junior synonyms. With the elevation of the *Cadulus* subgenera the name of the species becomes *Gadila aberrans* based on it's foot anatomy. Why it was placed in *Pulsellum* (in a different family) on the AFS list is not known, but this seems in error. The species should be placed in the Gadilidae on the SCAMIT taxonomic listing.

Pulsellum salishorum

A northern species not occurring in the Bight, originally described from Puget Sound. This differs from most other gadilids in lacking a constriction of the mature shell at the aperture; that is the largest diameter of the shell is at the anterior aperture. It is relatively strongly curved in the juvenile, with the rate of curvature decreasing rapidly to a nearly straight adult shell.

Polyschides californicus

The shell is translucent white and fragile compared to dentaliids or more robust gadilids such as *Gadila aberrans*. The diameter increases more rapidly with length than in either *Gadila* or *Siphonodentalium*, giving the shell a pudgy appearance. Unlike the *Cadulus* species of the eastern U.S., which have both the dorsal and ventral arcs of the shell convex, only the ventral arc is convex in west coast *Polyschides*. The genus is characterized by presence of several slits in the posterior aperture, but these are almost never visible - being routinely broken off. The species is found in muddy sediments on the outer shelf and upper slope. It can be separated from *P. tolmiei* by its more slender shell, and the presence of only a slight inflation prior to the apeture. The greatest shell diameter is much closer to the aperture in this species than in *P. tolmiei*. Adult *P. californicus* are also much longer than adult *P. tolmiei*.

Polyschides tolmiei

Has a lighter, thinner, less opaque shell that *P. californicus*, and tapers a bit less abruptly from the widest part of the shell to the anterior aperture. It is also has a greater maximum diameter relative to the length than *P. californicus*. Found in muddy habitats on the outer shelf and upper slope where it feeds like a dentaliid by ciliary movement of sediment to the mantle cavity along the stalks of the captacula (Poon 1987). The greatest width of the *P. tolmiei* shell occurs in the anterior 1/3 of the shell, while that of *P. californicus* occurrs in the anterior 1/6.

Siphonodentalium quadrifissatum

An inhabitant of inner and mid shelf sandy sediments *S. quadrifissatum* can be easily identified if the posterior aperture is intact. It is characterized by possession of four slits (thus the name) which divide the aperture into four lobes. If the posterior aperture is damaged and the slits and lobes are broken off the species can be recognized by having the diameter increasing evenly and slowly, with the dorsal and ventral arcs nearly parallel. In *Gadila aberrans* the ventral arc is always greater than the dorsal, giving the shell a slight belly. There is a bathymetric separation between *S. quadrifissatum* and the two *Polyschides* species, but were they to co-occur, *S. quadrifissatum* would be noticeable thicker shelled, and noticeably thinner in profile than either.

[*Gadila fusiformis*]

a synonym of ***Gadila aberrans*** (see Shimek 1989)

[*Gadila hepburni*]

a synonym of ***Gadila aberrans*** (see Shimek 1989)

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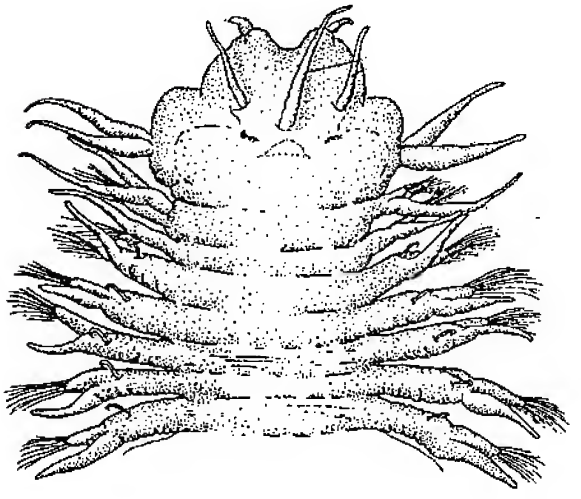
February, 1996 SCAMIT Newsletter Vol. 14, No.10

NEXT MEETING:	Pilargidae
GUEST SPEAKER:	Leslie Harris
DATE:	March 11, 1996
TIME:	9:30am - 3:30pm
LOCATION:	Worm Lab Natural History Museum of Los Angeles 900 Exposition Blvd, Los Angeles



Sigambra tentaculata
(from Blake 1994)

MARCH 11 MEETING

The March meeting will be on the polychaete family Pilargidae. It will be held at the Worm Lab of the Natural History Museum. Leslie Harris will be reviewing local species of this family. We will also discuss the recent state of *Pilargis berkeleyae* vs. *Pilargis maculata*. In the Pilargidae chapter of volume 4 of the MMS Atlas Blake reinstates *Pilargis maculata* and distinguishes it from *Pilargis berkeleyae* based on parapodial differences and body papillation. Previously Pettibone (1966) had synonymized the two species. Members

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should probably bring their specimens of *Pilargis berkeleyae* to the meeting for review and any other problem specimens. We will also spend some time discussing the most recently published polychaete volume (no. 5) of the MMS Atlas, particularly the chapter on Syllidae. Any problem syllids or species not treated in the chapter are also welcome.

REQUESTS FOR SPECIMENS

Cynthia Stonick at the Department of Ecology in Washington State is requesting that specimens of *Syllis(Typosyllis) alternata* be sent to her at:

Washington State Dept. of Ecology EILS
P.O. Box 47710
Olympia, Washington 98504-7710
Phone: (360) 497-6992
Fax: (360) 407-6884

Cynthia believes that our local *Syllis (Typosyllis) alternata* may not be the same as their local species up north. She would like some southern specimens to use for comparison.

Recent collections from off San Diego have increased the number of known but undescribed bodotriid cumaceans in the temperate eastern Pacific to 12, nine of which are in the genus *Cyclaspis*. There is very little material for over half of these species, including six of the nine *Cyclaspis*. Any unusual or atypical specimens of *Cyclaspis nubila*, *Vaunthomsonia* spp., or the provisionals *Cyclaspis* sp A, B, and C of SCAMIT would be welcomed for examination and return by Don Cadien. He can be contacted at the telephone and e-mail addresses listed on the back page of this issue or at;

Marine Biology Laboratory, JWPCP
24501 S. Figueroa St., Carson
California, 90745

Dr. Danny Eibye-Jacobsen will be visiting the area in May, and will be happy to review the polychaete genus *Eumida* with SCAMIT members. In support of this please send examples of your encountered *Eumida* spp. to Leslie Harris at NHMLAC for forwarding to Danny (or bring them to the March meeting at the museum). This will give him time to examine the material and formulate his opinions prior to meeting with us in May.

NEW LITERATURE

A noteworthy volume on the world genera of caridean shrimp has recently been received locally, although it has been out for a while. This work (Holthuis 1993) is a revised version of the author's 1955 paper dealing with the shrimp fauna worldwide. Keys are provided to infraorders, superfamilies, families and subfamilies, and to genera within each family. The nomenclatural history of each genus is provided, the type listed and illustrated (usually with a whole body illustration), but not diagnosed. The book is available from the Nationaal Natuurhistorisch Museum, Leiden, The Netherlands. This volume serves as a monument to the authors encyclopedic knowledge of this group and its literature.

The local shrimp species *Heptacarpus pictus* has recently been synonymized with a species previously thought to occur only further to the north, *Heptacarpus sitchensis* (Wicksten et al 1996). The presence or absence of an epipod on the second leg of these shrimp was shown to be a variable character, calling into question use of epipod occurrence or lack as a criterion variable for any hippolytid shrimps. Stay tuned!

There has recently been a spate of new papers dealing with the cladistic reexamination of the phylogeny of arthropods and other related phyla, in many cases arguing the value and meaning of molecular evidence (Boore et al 1995, Friedrich & Tautz 1995, Wagele 1995, and Wagele & Stanjek 1995 inter alia).

A new entry to this discussion is focussed on the annelids, but includes arthropods and other related groups (Rouse & Fauchald 1995). They conclude that the concept of "annelida" should be dropped. The scleractinian corals were also examined in a recent paper (Romano & Palumbi 1996) which found a difference between phylogenies based on morphological and molecular evidence. Interested parties will find all the above articles pertinent, if occasionally not easy reading.

ELECTION

We remind the members that their ballots on the 1996-97 slate of officers are due at the March meeting, or should be mailed to the secretary prior to that time. A number have been received so far, but we need to hear from the rest of you (hopefully with votes for write-in candidates).

CRUSTACEAN MEETING

The 1996 Summer Meeting of the Crustacean Society will be held between 14-18 July on the campus of the University of San Diego. Interested parties are urged to attend. Although the preregistration period will have passed by the time you receive your Newsletter, the meeting announcement and registration information is attached.

Olea RETAKEN

The small sacoglossan opisthobranch *Olea hansineensis* was taken off Palos Verdes during August 1995 CSDLAC benthic sampling. A single tiny individual was recovered from 30m depth on the north side of the Palos Verdes Peninsula. This animal, the sole species in the family Oleidae, is an egg predator on other opisthobranchs. It uses its sharp radular teeth to puncture the eggs, then sucks out the contents with muscular contractions of its buccal pump. This procedure is directly analogous to the suctorial feeding method used by other sacoglossans on algal cells. The species has been reported from our area on at least one previous occasion. It was found and collected in the field by divers (Ron McPeak and Dave Mulliner) during a dive at San Clemente Island; an amazing feat of *in situ* detection of an animal just a few millimeters long. Their collection forms the basis of the southern range information in Behrens (1991). All other records are from much further north. In the present collection there was no apparent egg substrate left in the picked sample. Those who encounter large opisthobranch egg masses in grabs or trawls should examine them for the presence of this animal. Specimens will generally be rendered cryptic by the coloring of the eggs already consumed, but close examination should reveal them.

MINUTES OF FEBRUARY 12 MEETING

The meeting opened with a discussion of the lumbrinerid chapter of volume 5 of the MMS Atlas. A few errors were noted.

On page 280 Hilbig states in the Taxonomic History section that the genus *Eranno* was synonymized with *Lumbrineris* by Hartman in her 1949 publication and this actually occurred in 1944. On page 282 the #3 footnote referred to in line 5A should be *Lumbrinerides platypygos* Fauchald 1970 not *Lumbrineris acutus*. On page 284 in the list of species there should be no parentheses around Moore, 1911 for *Lumbrineris index* and no parentheses around Audouin & Milne-Edwards, 1834 for *Lumbrineris latreilli*. On page 309, *Scoletoma tetraura* (Schmarda. 1861) should be listed as a new combination.

Larry Lovell began his discussion of lumbrinerids by giving us an update on what has recently occurred in the literature with our local species. There are basically three widely accepted genera that our local lumbrinerid species fall into. They are *Eranno*, *Lumbrineris*, and *Ninoe*. The genus *Scoletoma* has not yet been accepted by SCAMIT members, pending further investigation.

Eranno and *Scoletoma* are older names that have been recently resurrected. The genus, *Eranno* was erected in 1865 by Kinberg and later synonymized with *Lumbrineris* by Hartman (1944). Orensanz (1990) resurrected the genus with a different set of diagnostic characters. The genus *Scoletoma* was erected in 1828 by Blainville and was later synonymized with *Lumbrineris* by Audouin and Milne-Edwards (1833). Frame (1992) then resurrected the genus to its current status.

Traditionally, SCAMIT members have seldom used the jaw structure of lumbrinerids for identification purposes. We have relied mainly on the type of hooded hooks, color of the acicula, and the shape of the parapodial lobes. The presence or absence, along with the shape and denticulations, of the maxillae should now be taken into consideration during identification processes.

To examine the jaw structure of a lumbrinerid the tissue around the structure may be cleared using methyl salicylate (oil of wintergreen) and standard clearing techniques whereby the animal is first dehydrated in absolute or 95% alcohol. Using this technique, however, does not allow for easy manipulation so the teeth below may be viewed. Sometimes it is best to view the jaw structure by carefully making a slit dorsally with a very small scalpel and pulling back the tissue. Not only does this allow for better manipulation so that the teeth of the maxillae may be counted and viewed from different angles, but then the jaw structure is left intact with the worm for future reference.

While the maxillary formula (the number of denticulations per maxillae) is not a generic character, it may be used to assist in species identification. However, it should be used carefully since the teeth are inconsistent in juveniles and may be broken or worn in adults. Also, the maxillae V character is poorly understood for some species.

The color of the acicula in lumbrinerids is still considered an important characteristic in their identification. At the meeting several questions were raised as to what exactly is meant by the terms "yellow" and "black" or "dark". To tell the color of the acicula one should try to view the median or posterior parapodia of the lumbrinerid from the side. If the color is dark brown or black and definitely darker than the setae they should be considered "black" or "dark". If the color is clear or yellow or as light as the color of the setae then they should be considered "yellow". One should examine the whole length of the worm before determining the color of the acicula. Do not base your decision on examining only a few acicula posteriorly, but try to notice if there is any change in the color of the acicula along the length of the worm.

Another problem in the identification of lumbrinerids is broken setae. Without the presence of anterior hooded hooks the identification process can only be taken to family level. Often these setae get broken during field sampling or in the lab while sorting.

Care needs to be taken when processing benthic infaunal samples to be sure that lumbrinerids arrive at the taxonomist's microscope in the best possible condition. This may be achieved by using a relaxant like magnesium sulfate when fixing the samples with formalin, so the worms are not as stressed and don't fragment as much. Also, water pressure needs to be taken into consideration when rinsing the samples, as this too is hard on the animals and may break setae easily. The scraping of the sediment against the screen mesh while transferring to a container should also be kept to a minimum. Perhaps a float table could be used in the field and/or lab to process the samples, whereby the organisms are allowed to separate from the heavier sediment rather than being subjected to water pressure to force the excess sediment thru the screen. All these techniques should

be incorporated into the benthic infaunal sampling process for the best possible condition of all the organisms and have been discussed at previous meetings.

Often times lumbrinerids have their setae intact, but are fragmented with anterior and posterior ends. Larry cautioned members at the meeting that they should not try to put the pieces back together again (all the king's men couldn't do it with Humpty Dumpty). Unless it is obvious that a particular posterior end must be that of an anterior end because either it was the only one or only large or small one in the sample, this process should not be used to further the identification level. Larry also informed members that they should be able to identify a lumbrinerid to species level with only 20 - 30 anterior setigers of a **well preserved** specimen. With that many setigers one should be able to determine what the parapodial lobes would look like posteriorly if they were present.

Larry spent the rest of the morning going over the main characteristics of the genera that occur locally. The genus *Eranno* has differential characters that include simple hooded hooks, maxillae II that is only half as long as maxillae I, and a maxillae V that is present and either partially fused to maxillae IV or free. There are two species of *Eranno* that occur locally. They are *Eranno lagunae* and *Eranno bicirrata*. Hilbig (1995) transferred *Lumbrineris bicirrata* to the genus *Eranno* because it fit Orensanz' (1990) emended generic description with the presence of all simple capillaries and hooded hooks. The main difference between *Eranno lagunae* and *Eranno bicirrata* is that *Eranno bicirrata* has black acicula as opposed to *E. lagunae*, which has yellow acicula.

The main differential characteristic of the genus *Ninoe* is the presence of branchial lobes. There are approximately 2 - 15 digitiform lobes that arise from the postsetal parapodial lobe. Larry commented that species differentiation should not be based on the number of branchial lobes alone, since this is a developmental character. It should be noted that our common *Ninoe sp. A* of Harris has been described in volume 5 of the MMS Atlas as *Ninoe tridentata*.

The genus *Scoletoma* is distinguished by having simple capillaries and hooded hooks and a maxillae V that, if present, is free standing. Hilbig (1995) seems to have transferred *Lumbrineris tetraura* to the genus *Scoletoma* even though she does not state this as a new combination. While Frame (1992) resurrected the genus *Scoletoma* she did not include *L. tetraura*. In the second edition of SCAMIT's Taxa List *Lumbrineris "tetraura"* has not changed. SCAMIT members have decided not to accept this change yet. In Hilbig's key (1995) the length of M II compared with M I is a stronger diagnostic character separating the genera *Scoletoma* and *Eranno* then that of M V being free standing or partially fused to M IV. This is because MV is often very difficult to see because of its small size and placement within the jaw apparatus. The species name "tetraura" is in quotes in the Taxa List because it is believed to be a complex of species, one of which is a provisional of Leslie Harris, *Lumbrineris sp. A*. A brief description of Leslie's three provisional lumbrinerid species is included as a handout with this newsletter. Anyone with specimens fitting these descriptions should probably pass them on to Leslie for further examination.

Most of our local lumbrinerid species belong to the genus *Lumbrineris*. They fall into Groups I and II of the old SCAMIT group designations. Group I includes those species with compound hooks and yellow acicula. They are *L. cruzensis*, *L. latreilli*, *L. inflata*, and *L. limicola*. Group II includes those species with compound hooks and black acicula. They are *L. californiensis*, *L. japonica*, *L. index*, and *L. pallida*. The shape of the parapodial lobes is a main distinguishing

characteristic in both these groups. Included with this newsletter are some rough drawings that Larry did at the meeting of the posterior parapodial lobes of the common species of Group I and II. Amongst the Group II species *L. japonica* and *L. index* are very similar. However, while both *L. japonica* and *L. index* have elongated postsetal lobes, *L. japonica* has short postsetal lobes that remain about the same length throughout the body of the worm. The postsetal lobes of *L. index* are similar to *L. japonica* anteriorly, but posteriorly are much longer and digitiform. A problem arises if only the anterior end of either of these two species is all that is available for identification. During the afternoon session of the meeting we examined specimens of both these species and determined that anteriorly they were very similar. We also noticed that the blade length of the anterior compound hooks was relatively long in both species. Yet, another similarity that does not help to distinguish between anterior ends of these two species.

Within Group I species *L. latreilli* and *L. limicol*a seem to be the two most easily confused anteriorly. The difference seems to be with the denticulations of M III. *L. latreilli* has 2 teeth and *L. limicola* only 1 true tooth. Sometimes a slight boss is evident on the cutting edge of M III for *L. limicola* and because of this the teeth are not easily counted. The postsetal lobes of L. latreilli are short and rounded, whereas L. limicola has postsetal lobes that are long and tapering. We examined both of these species at the meeting and found this to be true. Hilbig (1995) suggests that only specimens with distinct bidentate M III be referred to *L. latreilli* and those with unidentate or indistinctly bidentate M III be identified as *L. limicola*.

Included with the newsletter is a key to lumbrinerid genera based on Frame (1992). With the publication of Hilbig's key (1995) this will probably not be very useful, but it has been included here since many members already had this rather simplified key in its handwritten, unrevised form unbeknownst to the author.

NAMIT Microcrustacean Meeting

By Dean Pasko

The Northern Association of Marine Invertebrate Taxonomists (NAMIT) held a microcrustacean workshop on January 25 and 26 at the University of Washington, Friday Harbor Laboratories. The meeting was hosted by Drs. Craig Staude and Jeff Cordell of the U. of W., who covered amphipods and copepods, respectively, and included Dr. Les Watling who discussed cumaceans (workshop schedule and handouts are attached.)

Our first day began with a stormy (snowy) drive and ferry ride across the Seattle area to Friday Harbor, San Juan Island. It was an unexpected pleasure to see some of the taller "hills" of the San Juan Islands covered in snow. Once we arrived however, we jumped into an entertaining *Introduction to the Amphipoda* by Craig, complete with Craig's Amazing Amphipod Cootie™ Game and real time video of live specimens. Craig tailored his lecture to the wide range of experience in the audience, from the novice taxonomist to seasoned systematist. He explained the terminology and morphology used with the Amphipoda and how to differentiate the major suborders. He described his methodology of specimen dissection and preparation of "permanent" slides. Craig prefers using a mixture of 50% glycerin in distilled water as a mounting medium. Before adding the coverslip, Craig adds a small drop of glycerin to the underside of the coverslip to prevent the formation of air bubbles. Finally he seals the edges of the coverslip with a layer of lacto-phenol. Others in the audience use nail polish, or, for the more well funded members of the group, Permamount™. Craig continued with a review of the common Gammaridea found in the area using his key in E.N. Kozloff's *Marine Invertebrates of the Pacific Northwest*

as a guide. Finally, Craig handed out a revised list of the Gammaridea which includes the many new species introduced into the literature via Amphipacifica.

After a delicious dinner break at the newly opened San Juan Brewery, Jeff Cordell provided an informative and interesting lecture on the history of copepodology and copepod systematics. Jeff, a fisheries biologist with the University of Washington's School of Fisheries, described his introduction to the copepods. His interest developed when, in the course of studying the diet of salmon, he came to the understanding that harpactacoid copepods are approximately 75% of out-spawning Chum and Pink Salmon diet. This led to the (unenviable?) task of understanding copepod systematics. Jeff continued with his wonderful description of the history of copepod systematics. He discussed several excellent references for students of copepodology, the most recent and most complete of which is Huys and Boxshall (1991). He gave an excellent explanation of copepod anatomy and morphology and an overview of the major suborders.

The second day began with Les Watling's discussion of the cumacea. He opened by announcing that he has a PEET Fellowship available for a PhD candidate interested in (ideally) combining crustacean (cumacean) systematics with techniques in molecular biology. Additionally, he has nearly completed his database of the world Cumacea. It is available as an Excel file by request, and will soon be available on the world wide web via the Darling Marine laboratories Website. He also noted that 75% of all cumaceans have been seen only once! Les then provided a terrific lecture about cumacean anatomy and morphology, and the relationship of specific structures to cumacean systematics. He completed his lecture with an interesting discussion on the phylogeny of the peracarids, which led to a creative discussion of the monophyletic vs polyphyletic origin of the group. He announced that there will be a one week course (series of seminars) on the peracarids at the Darling Marine Laboratory, University of Maine, following this summer's Crustacean Society Meetings. Those interested in attending should contact Dr. Watling.

These interesting seminars were followed by a short summary of the City of San Diego's Benthic Taxonomy Training Program and their Benthic Infauna Identification Training Manual. The fourth edition of the identification manual includes 7 volumes, with one copy each donated to NAMIT and the State of Washington Department of Ecology Laboratory (a copy of the manual will soon be made available through SCAMIT). Following the morning seminars, NAMIT held a workshop to discuss problem specimens.

Amphipod notes

The amphipod portion of the workshop was run by Craig Staude. It centered around two specimens from southern California: *Aoroides* sp A (see accompanying voucher sheet) and *Photis brevipes*. *Aoroides* sp A was compared to *Aoroides columbiae* and examined for the various characters listed in Table 1 (see voucher sheet). Craig had not seen this species before. Additionally, we briefly discussed the problem between *Photis brevipes* of southern California and the description of northern Pacific specimens discussed in Conlan and Bousfield (1983) (please refer to the extensive discussion of *Photis* in the SCAMIT newsletter Vol.13, No.12, p. 6).

Ampelisca agassizi* vs. *Ampelisca romigi

Specimens of *Ampelisca agassizi* and *A. romigi* from San Diego were also examined and compared to the descriptions and key in the recent MMS volume on the Amphipoda (Watling, 1995). Several problems or discrepancies were encountered. (1) San Diego *A. romigi* were identified based primarily on the distinct uncinate inner ramus

of uropod 3 (see Barnard, 1954); this character is not figured or described for the MMS *A. romigi*. (2) The relative length of antennae 1 used to distinguish these species in the MMS key and text (e.g., "short" in *A. agassizi* vs. "long" in *A. romigi*) was found to be unreliable. Both species from the San Diego area had "short" antennae 1 (i.e., A1 < A2 peduncle). (3) According to the MMS, the dorsal carina of urosomite 1 is highest in mid-segment in *A. agassizi* and highest posteriorly in *A. romigi*. The carina appears highest posteriorly in both species from San Diego. (4) The presence/absence of a notch on the distal anterior margin of article 5 of pereopod 7 is also used to differentiate these species in the MMS volume. This character may prove to be the most useful diagnostic feature. *A. romigi* appears to have a distinct "step-like" notch, similar to that seen in *A. pugetica*. No such "step-like" notch appears to occur in *A. agassizi*, although there may be a small setal insertion dimple at this location. One last note. Les Watling was surprised at the relative large size of the southern California *A. agassizi* compared to the common specimens he sees in Maine. He is sending some Atlantic specimens to compare with our critters.

Cumacean Notes

The cumacean portion of the workshop focused on a number of specimens from the Puget Sound area plus a couple of specimens from San Diego. Although none of the northern specimens appeared new, several (e.g., *Diastylis santamariensis* Watling & McCann, n. Sp.) represented range extensions for newly described species in the forthcoming MMS volume. *Diastylis paraspinulosa* was also verified and appeared to be quite common for this region. More information on the northern cumacean specimens may appear in a future NAMIT newsletter.

Between the Friday Harbor workshop and a follow-up the next week at the NHMLAC, Les examined specimens and verified San Diego records for a number of species, including several of the new MMS species. These included: the leuconid *Leucon* sp A (= *L. falcicosta* Watling & McCann n. sp.); the nannastacids *Campylaspis hartae, Campylaspis rubromaculata, Campylaspis* sp E (= *C. blakei* Watling & McCann n. sp.), *Cumella* sp A (= *C. californica* Watling & McCann n. sp.), and *Procampylaspis* sp A (= *P. caenosa* Watling & McCann n. sp.); the lampropid *Lamprops quadriplicata;* and the diastylid *Leptostylis villosa* (= *L. abditis* Watling & McCann n. sp.). On the other hand, problems arose when examining specimens of *Leptostylis* sp A from San Diego. Although we assumed these would be the new MMS species, *Leptostylis calva* Watling & McCann n. sp., Les concluded that they were in fact a distinct species, differing in the armature of the uropods and other features. Thus, the *Leptostylis* sp A in southern California may actually represent a species complex bearing further examination. Les also pointed out an additional change to earlier drafts of his MMS volume regarding the Dyastylidae. Briefly, what we call *Diastylis* sp A and *Leptostylis* sp E have been synonymized as *Diastylis crenellata* Watling & McCann n. sp. (*L.* Sp E is a juvenile of *D.* sp A).
We also took a look at *Diastylis* sp SD 1 from San Diego. Les agreed that this appeared to be a new species, although he said little could be done with it because it was a terminal molt male. Thus, it is likely that many of the diagnostic features of the species (i.e., females and subadult males) have been lost. No voucher sheet is yet available for this species. However, it can be characterized by the following traits: (1) row of large glassine spines along the lateral margins of the dorsal-ventrally compressed carapace and thoracic somites; (2) ventral margin of thoracic somite 1 obscured by anterior extension of thoracic somite 2; (3) abdominal somites spinous (e.g., various dorsal-medial, dorsal-lateral, and ventral-posterior spines; and (4) telson longer than peduncle of uropods, approximately 2.5x length of abdominal somite 6.

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THE CRUSTACEAN SOCIETY

1996 Summer Meeting*

(Open to anyone interested in Crustacea)

14-18 July 1996

UNIVERSITY OF SAN DIEGO
SAN DIEGO, CALIFORNIA

* See Tim Stebbins for details

ANNOUNCING
THE CRUSTACEAN SOCIETY SUMMER MEETINGS AND
THE THIRD INTERNATIONAL LARGE BRANCHIOPOD SYMPOSIUM

The TCS Summer Meetings and the Third International Large Branchiopod Symposium (ILBS3) will be held jointly at the University of San Diego, San Diego, California USA. July 14-18, 1996. Meeting rooms will be in the University Union and are equipped for the usual audio-visual needs as well as video and computer-aided platforms. The ILBS3 proceedings will be published in a special volume of Hydrobiologia. Participants will be able to reserve a copy at the meetings. Michel Boudrias will also be organizing a Peracarid Symposium within the TCS meeting schedule.

USD is a beautiful campus overlooking the bay, just fifteen minutes from San Diego International Airport. Shuttles are available 24 hours a day for under $20. Housing will be on campus in 2 room/2 bath apartments and will include most meals and access to the swimming pool, tennis courts and weight room. Activities scheduled include a complimentary welcome to California Reception and micro-brew taster, a Volleyball Tournament followed by a California Bar-B-Que (get your teams organized), a Mixer at the Steven Birch Aquarium by the Pacific Ocean (with live Jazz) and field trips to tide pools and Scripps Institution of Oceanography. Activities will be liberally dispersed between talk and poster sessions to maximize fun. Please note the early due date for registration and housing to reserve space.

San Diego is located on the Pacific Coast just 20 minutes from the Mexican border. Participants may come in one day early to play and get your Saturday stay-over airfares. Local activities and amusements (within a half hour drive) include shopping in Mexico, the San Diego Zoo and Wild Animal Park, Sea World, surfing, sunning, parasailing, sailing, golf, hiking and other "Outdoor Lifestyle" offerings. For those who enjoy the night-life, the area is a treasure trove of international cuisine and musical entertainment on both sides of the border.

We encourage you to stay on campus. You won't need a car and a double room in this area is $80-120 per night. Plus, we have a reputation for good food.

Please leave room for your slides or poster between the sports gear in your suitcase.

International ILBS student participants! We have travel awards available for international students and recent Ph.D's who will be presenting in the symposium. These will be awarded on the basis of need. If you need support, please submit a one page letter along with your abstract describing your research, where you are in your education, how much you need and why. Include a letter of support from your major professor/advisor. You will be notified as soon as we can process the requests.

TCS and ILBS3 1996 Summer Meeting
July 14-18, 1996

Abstract Transmittal Form

Please complete (typewritten in English) and return by March 1, 1996 to: TCS/ILBS3, c/o Marie A. Simovich, Biology Department, University of San Diego, San Diego, California 92110 USA. Acknowledgment of abstract will be sent by post card or e-mail. **Please note: Due date for registration and housing is March 1.**

Author(s), last name first:_____
_____

Institution of first author:_____
Address of first author:_____
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Paper to be presented orally _____or as a poster _____(check one).
To be part of: ILBS3 _____, TCS _____regular, TSC Peracarid _____
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Abstract: Please use clear type no smaller than 12 pitch or 10 point. Please submit your abstract on a separate page using the box as a size guide. The entire abstract must fit within a 4" x 5" box. Follow the format shown below. For an oral presentation, please indicate the speaker with an asterix (*).

Cumberlidge, Neil. Department of Biology, Northern Michigan University, Marquette, Michigan, 49855, USA. FRESHWATER CRABS AND HUMAN LUNG DISEASE IN AFRICA.

Fresh-water crabs are involved in the transmission of human lung fluke disease (paragonimiasis) in West and Central Africa. Species of fresh-water crab.....

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Registration: You must register in one of the following categories to attend talks.
*If you are not a TCS member, an ILBS3 presenter, or a student, you must pay this fee.

Number	Item	Total US $
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Details will accompany your registration confirmation.

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Lovell 12 Feb 96

Members of the family Lumbrineridae listed in "A Taxonomic Listing of Soft Bottom Macroinvertebrates" 4 March 1994. (1st edition)

Eranno lagunae	(Fauchald 1970)
Lumbrinerides platypygos	(Fauchald 1970)
Lumbrineris bassi	Hartman 1944
L. bicirrata	Treadwell 1929 — Hilbig 1995 new combination → Eranno bicirrata
L. californiensis	Hartman 1944
L. cruzensis	Hartman 1944
L. erecta	(Moore 1904)
L. index	Moore 1911
L. inflata	Moore 1911
L. japonica	(Marenzeller 1879)
L. latreilli	Audouin & Milne-Edwards 1834
L. limicola	Hartman 1944
L. minima	Hartman 1944
L. pallida	Hartman 1944
L. "tetraura"	
L. zonata	(Johnson, 1901)
L. sp. B	Harris 1984
Ninoe sp. A	Harris 1985 — Hilbig 1995 new species → Ninoe tridentata
Paraninoe fusca	(Moore 1911)

Additional taxa not listed

Lumbrineris sp. A	Harris 1984
L. sp. C	Harris

Lovell 12 Feb 96

Group I w/ composite falcigers, yellow acicula

L. cruzensis

Dorsal view

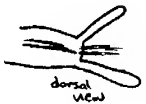
L. limicola

L. latreilli

} Lateral view

Group II - composite falcigers, black acicula (compound)

L. californiensis -



L. japonica -

L. index -

Lovell 13 Feb 96

"Lumbrineris" groupings

Group I	L. cruzensis	L. latreilli	L. inflata	L. limicola

Compound hooks
yellow acicula

Group II	L. californiensis	L. japonica	L. index	L. pallida

Compound hooks
black acicula

Group III	Eranno lagunae	Lumbrineris "tetraura"	L. sp. A

Simple hooks
yellow acicula

L. sp. B	L. sp C	L. minima	L. bassi

L. erecta	L. zonata	Lumbrinerides platypygos

(Eranno)
Group IV Lumbrineris bicirrata

Simple hooks
black acicula

February 1996

Provisional *Lumbrineris* Species of L. Harris

Lumbrineris sp. A

- Simple, multidentate hooks begin on setigers 6 - 7
- Posterior postsetal lobes elongate
- Yellow acicula
- Whole worm is long and slender
- Prostomium pointed
- Some people key this to *L. tetraura* or to *L. platylobata*, based on either postsetal lobes or start of hooks
- Common in Santa Monica Bay, Goleta, Morro Bay

Lumbrineris sp. B

- Simple, multidentate hooks begin setiger 6
- Both presetal and postsetal lobes elongate in posterior
- Yellow acicula
- Pointed prostomium
- Long Beach

Lumbrineris sp. C

- Simple hooks begin setiger 1
- Both presetal and postsetal lobes elongate in posterior
- Presetal lobes longer than postsetal lobes, similar to *L. minima*
- Yellow acicula
- Rounded prostomium
- Identified by others as *L. minima*, but examination of *L. minima* holotype shows that its hooks begin on setiger 13
- Santa Monica Bay, San Diego

Key to Lumbrinerid Genera (based on Frame, 1992)

by Cheryl Brantley
Oct. 1992
(revised Feb. 1996)

1. **Multidentate hooded hooks.....2**
   Bidentate hooded hooks.....*Lumbrinerides*

2. **Composite, multidentate hooded hooks.....3**
   Simple, multidentate hooded hooks.....4

3. **Composite spinigers and limbate setae.....*Lumbricalus***
   Limbate setae only.....*Lumbrineris*

4. **With branchial filaments on postsetal lip of parapodia.....5**
   Without branchial filaments.....6

5. **Postsetal branchiae in the form of a single lobe; maxilla III amd IV with smooth cutting edges; with nuchal papilla.....*Paraninoe***

   Postsetal branchiae with more than 1 filament; maxilla III and IV with cutting edges finely denticulate; without nuchal papilla.....*Ninoe*

6. **Partial or complete fusion of maxilla IV and V.....7**
   Maxilla V separate from IV.....*Scoletoma*

7. **With broad basal supports attached to maxilla II and long, digitate posterior postsetal lobes.....*Eranno***

   Without broad basal supports attached to maxilla II.....*Abyssoninoe*

* ***Abyssoninoe*** **- Maxilla IV and V are fused with the characteristic aspect of a broad rectangular plate with tooth protruding from middle of its inferior border.**

Please note: Hilbig (1995) makes comments on the genera *Abyssoninoe* and *Paraninoe* in her Lumbrinerid key, that they may be synonyms of *Scoletoma* and they are also not known from California along with the genus *Lumbricalus*.

- NAMIT MICROCRUSTACEAN WORKSHOP -
Copepods - Cumaceans - Amphipods

at Friday Harbor Laboratories on San Juan Island, WA
Thursday, January 25th, to Friday, January 26th

Schedule:

Thursday

(Ferry arrives from Sidney at 1:50pm)
3pm Introductory Remarks > Lecture Hall
3:15pm-4:45pm Amphipods - Craig Staude > Lecture Hall
(break for dinner in town)
7pm-8:30pm Copepods - Jeff Cordell > Lecture Hall

Friday

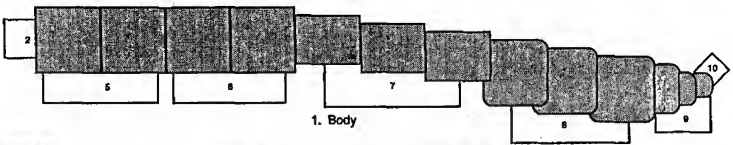
7:30am Coffee, Donuts, etc. > Lecture Hall
8am-9:30am Cumaceans - Les Watling > Lecture Hall
(Ferry leaves for Sidney at 9:50am)
10:30am-12am Open discussion/problem specimens > Lab 5
(break for lunch in town)
2pm-4pm Open discussion/problem specimens > Lab 5

Formal presentations are in the Lecture Hall. The subsequent open-discussion sessions will be held in Lab No. 5, where several microscopes are provided. (Bring your problem specimens and dissection tools.) Park at the Dining Hall near the Lecture Hall, or in the main parking lot near the entrance. BRING A FLASHLIGHT for the evening session.

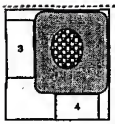
Craig Staude, University of Washington, Friday Harbor Labs, 1993.

Craig's Amazing Amphipod Cootie™ Game

Roll the dice, then glue on the body part with that number. (You must add the head first. Choose any part, if you roll an 11 or 12.)

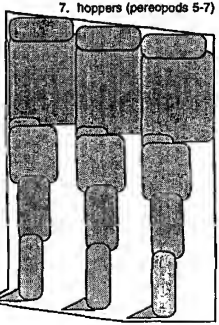


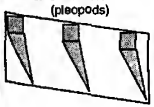
Cut out the pieces below this line.



4. munchers (mouthparts)

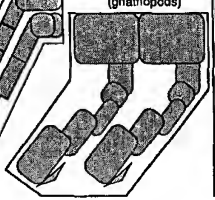
10. tail (telson)


7. hoppers (pereopods 5-7)

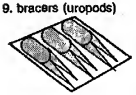

8. swimmers (pleopods)

3. feelers (antennae)

5. grabbers (gnathopods)



6. walkers (pereopods 3&4)


9. bracers (uropods)

A revision of the checklist of Gammaridea in "Kozloff's Keys" (Staude, 1987[1]) compiled by Craig P. Staude, January 1996.

The species included in this list occur from S.E. Alaska to northern California, from the marine and estuarine intertidal zone to a depth of about 200 meters. As in the original, this checklist largely follows the phylogenetic scheme of Bousfield (1983)[2], with reference to the more recent papers of Bousfield and Staude (1994)[3] and Bousfield and Shih (1995)[3]. Changes since the 1987 edition appear in boldface. Taxa not present in the 1987 keys are indicated by an asterisk.

Superfamily Eusiroidea

Family Pontogeneiidae

Accedomoera vagor Barnard, 1969. Intertidal and shallow subtidal; on algae and mixed sediments.

Paramoera bousfieldi Staude, **1995**. Intertidal; sometimes near freshwater seepage; in mixed sediment (especially cobbles).

Paramoera bucki Staude, **1995**. Intertidal in freshwater seepage and in the tidal region of streams; in gravel.

Paramoera carlottensis Bousfield, 1958. Intertidal; especially in low-salinity tidepools and seepage; mixed sediment.

Paramoera columbiana Bousfield, 1958. Low intertidal; especially in situations of low salinity; in gravel and other sediments.

Paramoera leucophthalma Staude, **1995**. Subtidal; in gravel and fine sediment.

Paramoera mohri Barnard, 1952. Intertidal (rarely subtidal); in gravel.

Paramoera serrata Staude, **1995**. Low intertidal; in coarse sand and mixed sediment.

Paramoera suchaneki Staude, **1995** (fig. 18.78). Intertidal; in gravel and cobbles or in mussel beds.

Pontogeneia inermis (Krøyer, 1838). Habitat uncertain; known on this coast only from a single dubious specimen.

Pontogeneia intermedia Gurjanova, 1938. Intertidal and shallow subtidal; on algae and various sediments.

Pontogeneia cf. *ivanovi* Gurjanova, 1951 (fig. 18.15). Low intertidal and shallow subtidal; mixed sediments (especially sand); not in complete agreement with Gurjanova's description.

Pontogeneia cf. *rostrata* Gurjanova, 1938. Low intertidal and subtidal; on algae and various sediments; not in complete agreement with Gurjanova's description.

Family Eusiridae

***Eusirus columbianus* Bousfield and Hendrycks, 1995** (was cf. *longipes*). Deep subtidal; on fine sediment and probably also pelagic

***Rhachotropis barnardi* Bousfield and Hendrycks, 1995** (was *clemens*) (fig. 18.66). Deep subtidal; on fine sediment and probably also pelagic.

****Rhachotropis conlanae* Bousfield and Hendrycks, 1995**. Deep subtidal; on fine sediment and probably pelagic.

****Rhachotropis miniata* Bousfield and Hendrycks, 1995**. Deep subtidal; on fine sediment and probably also pelagic.

Rhachotropis oculata (Hansen, 1887). Deep subtidal; on fine sediment and probably also pelagic.

Family Calliopiidae

Calliopius spp. (fig. 18.76). Low intertidal to deep subtidal; on algae or mixed sediment and around docks; somewhat pelagic; there are probably 2 or 3 species in local waters, perhaps all undescribed.

Paracalliopiella pratti (Barnard, 1954). Low intertidal and subtidal; on algae, mixed sediment, and especially seagrasses; variants with atypical antennae.

Oligochinus lighti Barnard, 1969. Low intertidal; in mixed sediments and among algae.

Oradarea longimana (Boeck, 1871). Subtidal (sometimes deep); mixed mud, sand, and shell (possibly commensal).

Superfamily Oedicerotoidea

Family Oedicerotidae

Bathymedon flebilis Barnard, 1967. Subtidal; fine sediment.
Bathymedon pumilus Barnard, 1962. Subtidal; fine sediment.
Monoculodes spp. Low intertidal to deep subtidal; fine sediment; *M. zernovi* Gurjanova, 1938 (fig. 18.68) and *M. spinipes* Mills 1962 have been reported (see Mills, 1962).
Synchelidium rectipalmum Mills, 1962. Low intertidal and subtidal; sandy sediment.
Synchelidium shoemakeri Mills, 1962. Low intertidal to deep subtidal; fine sediment.
Westwoodilla caecula (Bate, 1856) (fig. 18.67). Low intertidal to deep subtidal; fine sediment.
Unidentified sp. Deep subtidal; fine sediment; an undescribes species near *Aceroides kobjakovae* Bulytscheva 1952.

Superfamily Leucothoidea

Family Pleustidae

Chromopleustes *oculatus* (Holmes, 1908). Subtidal, habitat poorly known.
****Chromopleustes lineatus* Bousfield & Hendrycks, 1995.** Low intertidal to subtidal, on rocks with algae and surfgrass.
****Dactylopleustes echinoides* Bousfield & Hendrycks, 1995**. Low intertidal to subtidal, possibly commensal on echinoids.
Gnathopleustes *den* (Barnard, 1969). Intertidal; exposed rocky beaches.
****Gnathopleustes pachychaetus* Bousfield & Hendrycks, 1995.** Low intertidal to subtidal, on rocks with algae.
Gnathopleustes *pugettensis* (Dana, 1853) group. Low intertidal to subtidal; on various substrata, and sometimes commensal; a group of species, incompletely described.
****Gnathopleustes serratus* Bousfield & Hendrycks, 1995**. Low intertidal rocky shores.
****Gnathopleustes simplex* Bousfield & Hendrycks, 1995**. Low intertidal to subtidal, on rocks with sponge and algae.
****Gnathopleustes trichodus* Bousfield & Hendrycks, 1995**. Subtidal, habitat unknown.
Micropleustes *nautilus* (Barnard, 1969) (fig. 18.77). Intertidal, exposed rocky beaches.
****Micropleustes nautiloides* Bousfield & Hendrycks, 1995**. Intertidal and shallow subtidal algal mats and seagrass.
****Pleustes constantinius* Bousfield & Hendrycks, 1994.** Shallow subtidal, habitat unknown.
****Pleustes victoriae* Bousfield & Hendrycks, 1994.** Low intertidal to subtidal, habitat unknown.
Pleusirus secorrus Barnard, 1969. Low intertidal and subtidal; cobbles.
Pleusymtes subglaber (Barnard & Given, 1960). Subtidal; sand.
Pleusymtes sp. Shallow subtidal; sandy(?) sediment; probably undescribed.
****Thorlaksonius borealis* Bousfield & Hendrycks, 1994**. Low intertidal and subtidal rocks with algae.
****Thorlaksonius brevirostris* Bousfield & Hendrycks, 1994.** Low intertidal and subtidal, on algae and seagrass.
****Thorlaksonius carinatus* Bousfield & Hendrycks, 1994**. Shallow subtidal rocks with algae.
Thorlaksonius *depressus* (Alderman, 1936) (fig. 18.65). Subtidal; on algae attached to rock surfaces, and on eelgrass.
****Thorlaksonius grandirostris* Bousfield & Hendrycks, 1994**. Low intertidal rocks with seagrass, probably a snail mimic.
****Thorlaksonius subcarinatus* Bousfield & Hendrycks, 1994**. Low intertidal and subtidal rocks with algae.
****Thorlaksonius truncatus* Bousfield & Hendrycks, 1994**. Shallow subtidal sand with drift algae.
****Trachypleustes trevori* Bousfield & Hendrycks, 1995**. Low intertidal rocks with algae.
****Trachypleustes vancouverensis* Bousfield & Hendrycks, 1995**. Low intertidal rocks with algae.

[Families Acanthonotozomatidae and Lafystiidae, see Superfamily Stegocephaloidea]

Family Amphilochidae

Amphilochus litoralis Stout, 1912. Low intertidal; probably commensal.
Amphilochus neapolitanus Della Valle, 1893. Low intertidal; probably commensal.
Amphilochus picadurus Barnard, 1962. Low intertidal; probably commensal.
Gitanopsis vilordes Barnard, 1962. Low intertidal; probably commensal.

Family Stenothoidae

Metopa cistella, Metopa ?dawsoni, Metopella ?carinata, Proboloides sp., and *Stenula* spp. have been reported locally. Low intertidal to deep subtidal; often commensal with anemones, hydroids, and sea pens; a poorly known group whose species are difficult to identify due to their small size and the need to examine mouthpart structure.

Family Leucothoidae

Leucothoe sp. (fig. 18.7). Low intertidal and subtidal; probably commensal; distinct from *L. alata* and *L. spinicarpa*, and probably undescribed.

Superfamily Talitroidea

Family Hyalidae

Allorchestes angusta Dana, 1856 group (at least 4 species). Intertidal and shallow subtidal; ranging into water of reduced salinity; on various substrata and among drift algae or wood chips.
Allorchestes bellabella Barnard, 1974. Intertidal (and also planktonic).
Hyale anceps (Barnard, 1969). Low intertidal; rocky beaches with algae.
Hyale frequens Stout, 1913 (fig. 18.34) group (about 10 species). Mid-intertidal to shallow subtidal; on various substrata with algae.
Hyale pugettensis (Dana, 1852). High intertidal tidepools; possibly synonymous with *H. californica* Barnard, 1969.
Hyale plumulosa (Stimpson, 1857). Low intertidal; mixed sediment (especially cobbles) with algae.
Parallorchestes spp. Intertidal to shallow subtidal; usually on rocky beaches with algae; Bousfield (1981) indicates that there are 12 species of *Parallorchestes*, including *P. ochotensis* (Brandt, 1851) and some undescribed species, along the North Pacific Rim.

Family Dogielinotidae

Proboscinotus loquax (Barnard, 1967). Intertidal, burrowing in sandy beaches of the outer coast.

Family Najnidae

Najna spp. Low intertidal and shallow subtidal; on *Alaria* and other algae, burrowing into stipes; Bousfield (1981) indicates that there are 10 species of *Najna*, including *N. kitamati* Barnard, 1979 (*N. ?consiliorum* of Barnard, 1962c), along the North Pacific Rim.

Family Talitridae

Megalorchestia californiana Brandt, 185l. High intertidal; sandy beaches of the open coast.
Megalorchestia columbiana (Bousfield, 1958). High intertidal; sandy beaches (occasionally in brackish situations).
Megalorchestia pugettensis (Dana, 1853). High intertidal; coarse to fine sand; open coast to protected estuaries.
Paciforchestia klawei (Bousfield, 1961). High intertidal; coarse sand and gravel (habitat incompletely known).
Platorchestia chathamensis Bousfield, 1982. High intertidal; among driftwood logs; known from a single specimen collected near Victoria, British Columbia.
Traskorchestia georgiana (Bousfield, 1958). High intertidal; coarse sand and gravel beaches.
Traskorchestia traskiana (Stimpson, 1857). High intertidal; widely distributed, but largely associated with gravel and rocky beaches.

Superfamily Phoxocephaloidea

Family Phoxocephalidae

Cephalophoxoides *bomilis* (Barnard, 1960). Deep subtidal; fine sediment.

Eobrolgus ***chumashi*** **Barnard & Barnard, 1981** (was *spinosus*) (fig. 18.64). Intertidal and shallow subtidal; fine sediment (especially sandy mud).

Eyakia robusta (Holmes, 1908). Subtidal; fine sediment.

****Foxiphalus aleuti*** **Barnard & Barnard, 1982**. Subtidal to deep, sand.

****Foxiphalus falciformis*** **Jarrett & Bousfield, 1994**. Low intertidal, sand.

****Foxiphalus fucaximeus*** **Jarrett & Bousfield, 1994**. Low intertidal, sand.

Foxiphalus obtusidens (Alderman, 1936). Low intertidal and subtidal, fine sediment, S. of Oregon.

Foxiphalus similis (Barnard, 1960). Subtidal to deep, fine sediment.

****Foxiphalus xiximeus*** **Barnard & Barnard, 1982**. Low intertidal to subtidal, sand.

****Grandifoxus aciculatus*** **Coyle, 1982**. Subtidal to deep, fine sediment.

****Grandifoxus dixonensis*** **Jarrett & Bousfield, 1994**. Deep, fine sediment.

Grandifoxus grandis (Stimpson, 1856). Intertidal and shallow subtidal; sand; synonymous with *Paraphoxus milleri* Thorsteinson, 1941.

****Grandifoxus lindbergi*** **(Gurjanova, 1953)**. Shallow subtidal, sand.

****Grandifoxus longirostris*** **(Gurjanova, 1938)**. Subtidal, sand.

Harpiniopsis fulgens Barnard, 1960. Deep subtidal; fine sediment.

****Heterophoxus affinis*** **(Holmes, 1908)**. Subtidal to deep, fine sediment

****Heterophoxus conlanae*** **Jarrett & Bousfield, 1994**. Subtidal fine sediment.

****Heterophoxus ellisi*** **Jarrett & Bousfield, 1994**. Subtidal fine sediment.

Heterophoxus oculatus (Holmes, 1908). Subtidal (sometimes deep); mud, S. of Oregon.

Majoxiphalus *major* (Barnard, 1960). Low intertidal to subtidal; fine sediment.

****Majoxiphalus maximus*** **Jarrett & Bousfield, 1994.** Low intertidal and subtidal, fine sediments.

****Mandibulophoxus alaskensis*** **Jarrett & Bousfield, 1994**. Low intertidal to subtidal, fine sediment.

Mandibulophoxus gilesi Barnard, 1957. Subtidal; fine sediment.

****Mandibulophoxus mayi*** **Jarrett & Bousfield, 1994**. Low intertidal to subtidal, fine sediment.

Metaphoxus fultoni (Scott, 1890) (fig. 18.69). Deep subtidal; fine sediment.

Parametaphoxus qualeyi **Jarrett & Bousfield, 1994** (was *Metaphoxus frequens*). Deep subtidal; fine sediment.

~~*Paraphoxus oculatus*~~ (not confirmed from the Pacific).

****Paraphoxus communis*** **Jarrett and Bousfield, 1994**. Low intertidal to shallow subtidal, mixed sediment.

****Paraphoxus gracilis*** **Jarrett and Bousfield, 1994** (was *oculatus*). Subtidal to deep mud.

****Paraphoxus pacificus*** **Jarrett and Bousfield, 1994**. Low intertidal to subtidal, mixed sediment.

****Paraphoxus similis*** **Jarrett and Bousfield, 1994**. Subtidal, mixed sediment (not *P. similis* Barnard 1960).

Rhepoxynius abronius (Barnard, 1960). Shallow subtidal; fine sediment (especially sandy mud).

****Rhepoxynius barnardi*** **Jarrett & Bousfield, 1994**. Subtidal, fine sediment.

Rhepoxynius bicuspidatus (Barnard, 1960). Deep subtidal; fine sediment, S. of Oregon.

Rhepoxynius ***boreovariatus*** **Jarrett and Bousfield, 1994** (was *variatus*). Subtidal; fine sediment.

Rhepoxynius daboius (Barnard, 1960). Subtidal; fine sediment.

**Rhepoxynius fatigans* (Barnard, 1960). Subtidal to deep, fine sediment.

Rhepoxynius heterocuspidatus (Barnard, 1960). Subtidal; fine sediment.

**Rhepoxynius pallidus* (Barnard, 1960). Low intertidal and subtidal; fine sediment.

Rhepoxynius tridentatus (Barnard, 1954). Low intertidal and subtidal; fine sediment.

Rhepoxynius vigitegus (Barnard, 1971). Subtidal; fine sediment.

Family Urothoidae

Urothoe* spp. Deep fjords; there are perhaps 2 or 3 species, **including *U. denticulata* Gurjanova 1951.

Superfamily Lysianassoidea

* Family Cyphocaridae

Cyphocaris challengeri Stebbing, 1888. Deep subtidal; pelagic.

Family Lysianassidae

Acidostoma ***bancocki*** **Hurley 1963**. Subtidal (sometimes deep); on soft sediment; possibly commensal.

Allogausia *recondita* Stasek, 1958. Intertidal; commensal in the gut of sea anemones; not reported north of Oregon.

Anonyx cf. *laticoxae* Gurjanova, 1962. Shallow to deep subtidal; soft sediment; some local populations mature at an unusually small size; possibly an undescribed species or pair of species.

Anonyx cf. *lilljeborgi* Boeck, 1870 (fig. 18.70). Shallow to deep subtidal; soft sediment; uropod 2 not very constricted; probably a new species.

Aristias pacificus Schellenberg, 1936. Subtidal; commensal with brachiopods and ascidians; possibly synonymous with *A veleronis* Hurley, 1963; determination uncertain.

Aruga *holmesi* Barnard, 1955. Subtidal (sometimes deep); soft sediment.

Hippomedon spp. Subtidal (sometimes deep); soft sediment; undescribed species expected (see Jarrett & Bousfield, 1982).

Koroga megalops Holmes, 1908. Subtidal (sometimes deep); soft sediment.

Lepidepecreum garthi Hurley, 1963. Deep subtidal; soft sediment.

Lepidepecreum gurjanovae Hurley, 1963 (fig. 18.71). Shallow to deep subtidal; on various substrata (kelp holdfasts to soft sediment); undescribed

Opisa tridentata Hurley, 1963. Deep subtidal, soft sediment.

Orchomene sp. Intertidal; possibly commensal with anemones; similar to *Orchomene recondita* (Stasek, 1958).

Orchomene decipiens (Hurley, 1963). Deep subtidal; soft sediment.

Orchomene obtusus (G. O. Sars, 1890). Subtidal (sometimes deep); epibenthic and on soft sediment; abundant in waters of British Columbia, but not yet reported in Washington.

Orchomene pacificus (Gurjanova, 1938). Subtidal (sometimes deep); on various substrata.

Orchomene cf. *pinguis* (Boeck, 1871). Low intertidal and subtidal; mixed sediment.

Pachynus cf. *barnardi* Hurley, 1963. Subtidal (sometimes deep); soft sediment; absence of eyes and structure of accessory flagellum do not agree with Hurley's description.

Prachynella lodo Barnard, 1964. Subtidal; mixed sediment.

Psammonyx longimerus Jarrett & Bousfield, 1982. Subtidal (sometimes deep); sandy sediment.

Schisturella cocula Barnard, 1966. Deep subtidal; soft sediment.

Wecomedon similis Jarrett & Bousfield, 1982. Intertidal and subtidal; soft sandy sediment.

Wecomedon wecomus (Barnard, 1971). Low intertidal to deep subtidal; soft sandy sediment.

Superfamily Synopioidea

Family Synopiidae

Bruzelia tuberculata G. O. Sars, 1895. Deep subtidal; soft sediment.

Syrrhoe longifrons Shoemaker, 1964. Deep subtidal; soft sediment.

Tiron biocellata Barnard, 1962 (fig. 18.62). Low intertidal to deep subtidal; various sediments.

Family Argissidae

Argissa hamatipes (Norman, 1869). Subtidal (sometimes deep); soft sediment; possibly a group of undescribed species.

Superfamily Stegocephaloidea (see disscussion of superfamily revision of Moore, 1992)

***Family Stegocephalidae**

****Stegocephalexia penelope* Moore, 1992**. Subtidal.

Family Acanthonotozomatidae *sensu lato* (including families **Iphimediidae and Odiidae**)

Cryptodius kelleri Bruggen, 1907. Subtidal; rocky substrata, especially with algae; on Amchitka Is., AK, this species co-occurs with the similar appearing species, *Imbrexodius oclairi* Moore, 1992.

***Iphimedia rickettsi* (Shoemaker, 1931)** (was *Coboldus* sp.) Subtidal; rocky substrata, especially with algae (e. g., corallines and kelp holdfasts), possibly commensal; similar to *Coboldus hedgpethi* Barnard, 1969 from California.

Family Lafystiidae

*members of this family are fish parasites (see Bousfield and Kabata, 1988, Canadian Spec. Pub. Fish. Aquat. Sci. 101)

Superfamily Pardaliscoidea

Family Stilipedidae

**Stilipes* sp. Deep fjords.

Family Pardaliscidae

Rhynobalicella balona (Barnard, 1971). Subtidal (sometimes deep); soft sediment.

**Pardalisca cuspidata* Krøyer, 1842. Deep subtidal; soft sediment.

Pardalisca tenuipes G. O. Sars, 1893. Deep subtidal; soft sediment.

****Pardaliscella symmetrica* Barnard, 1959**. Deep subtidal, soft sediment.

Superfamily Dexaminoidea

Family Atylidae

****Atylus borealis* Bousfield and Kendall, 1994**. Shallow subtidal sand and eelgrass.

Atylus collingi (Gurjanova, 1938). Shallow subtidal; sand and gravel (especially with eelgrass); euryhaline.

****Atylus georgianus* Bousfield and Kendall, 1994**. Shallow subtidal sand and eelgrass.

Atylus levidensus Barnard, 1956. Low intertidal and subtidal; various sediments (especially sand).

Atylus tridens (Alderman, 1936) (fig. 18.63). Low intertidal and subtidal; associated with sand, eelgrass, and rocky bottoms; occasionally pelagic.

Family Dexaminidae

Guernea reduncans (Barnard, 1957). Subtidal; soft sediments.

****Polycheria carinata* Bousfield & Kendall, 1994**. Low intertidal to subtidal, commensal on ascidians and sponges.

****Polycheria mixillae* Bousfield & Kendall, 1994**. Low intertidal to subtidal, commensal on sponges.

Polycheria osborni Calman, 1898. Low intertidal; commensal on compound ascidians.

Superfamily Ampeliscoidea

Family Ampeliscidae

Ampelisca agassizi (Judd, 1896) (fig. 18.72). Low intertidal to subtidal; tube-building in soft sediment.

Ampelisca brevisimulata Barnard, 1954. Subtidal (sometimes deep); tube-building in soft sediment.

Ampelisca careyi Dickinson, 1982. Subtidal (sometimes deep); tube-building in soft sediment; Dickinson recently distinguished *A. careyi* from *A. macrocephala* Lilljeborg, 1842; some local specimens display characters that seem to be intermediate between those typical of the two species.

Ampelisca cristata Holmes, 1908. Subtidal (sometimes deep); tube-building in coarse sand.

Ampelisca fageri Dickinson, 1982. Intertidal and subtidal; tube-building in mixed sand and boulders.

Ampelisca hancocki Barnard, 1954. Subtidal (sometimes deep); tube-building in soft sediment.

Ampelisca lobata Holmes, 1908. Subtidal; tube-building in mixed sand and rock, often associated with plants.

Ampelisca pugetica Stimpson, 1864. Subtidal; tube-building in sand.

Ampelisca unsocalae Barnard, 1960. Subtidal (sometimes deep); tube-building in very fine sediment.

Byblis millsi Dickinson, 1983. Subtidal (sometimes deep); tube-building in soft sediment; ramal spines of uropod 1 very small in local specimens; other species expected in depths of 200 m or more.

Byblis veleronis Barnard, 1954. Subtidal (sometimes deep); tube-building in soft sediment; other species expected in depths of 200 m or more.

Haploops tubicola Lilljeborg, 1856. Deep subtidal; tube-building in soft sediment.

Superfamily Pontoporeioidea

*Family Pontoporeiidae

***Pontoporeia femorata* Kroyer, 1842.** Shallow subtidal, soft sediment.

Family Haustoriidae

Eohaustorius brevicuspis Bosworth, 1973. Shallow subtidal; sand.

Eohaustorius estuarius Bosworth, 1973. Estuarine; sand.

Eohaustorius sawyeri Bosworth, 1973. Shallow subtidal; sand.

Eohaustorius sencillus Barnard, 1962. Shallow subtidal; sand.

Eohaustorius washingtonianus (Thorsteinson, 1941). Intertidal and shallow subtidal; sand.

Superfamily Gammaroidea

Family Anisogammaridae

Anisogammarus pugettensis (Dana, 1853). Intertidal and subtidal; various substrata, but especially associated with eelgrass, algae, and deposits of wood chips.

Eogammarus confervicolus (Stimpson, 1856) (fig. 18.75). Estuarine, intertidal, and subtidal; various substrata, but especially associated with sedges, eelgrass, algae, and deposits of wood chips.

Eogammarus oclairi Bousfield, 1979. Estuarine, intertidal, and shallow subtidal; various substrata; characters may intergrade with those of *E. confervicolus*, making identification difficult.

Locustogammarus levingsi Bousfield, 1979. Estuarine and intertidal; cobble and shingle beaches.

Ramellogammarus ramellus (Weckel, 1907). Stream mouths and high intertidal; coarse sand, stones, and wood debris.

Ramellogammarus vancouverensis Bousfield, 1979. Stream mouths and high intertidal; coarse sand, stones, and wood debris.

Family Gammaridae

Lagunogammarus setosus (Dementieva, 1931). Estuarine, intertidal, and subtidal; fine sediments.

Superfamily Melphidippoidea

Family Melphidippidae

Melphidippella and *Melphissana* have been reported locally; species of this family are rare in Washington waters, and poorly known; deep subtidal; in soft sediment.

Family Megaluropidae

Megaluropus sp. Intertidal and subtidal; associated with algae, but also planktonic; probably undescribed.

Superfamily Hadzioidea

Family Melitidae

Ceradocus spinicaudus (Holmes, 1908) (fig. 18.80). Intertidal and subtidal; cobbles.
Elasmopus spp. Intertidal; associated with algal cover on rocks; not confirmed north of California.
Maera danae Stimpson, 1853. Shallow to deep subtidal; fine sediment to gravel.
Maera loveni (Bruzelius, 1859). Subtidal; mud.
Maera simile Stout, 1913. Shallow subtidal; associated with algal cover on rocks.
Melita californica Alderman, 1936. Intertidal to deep subtidal; cobbles to fine sediment; some subtidal individuals may belong to an undescribed species.
Melita dentata (Krøyer, 1842) (fig. 18.74). Low intertidal to deep subtidal; on various substrata.
Melita desdichada Barnard, 1962. Low intertidal and subtidal; soft sediment.
Melita oregonensis Barnard, 1954. Intertidal; associated with algal cover on rocks.
Melita sulca (Stout, 1913). Low intertidal to deep subtidal; associated with algal cover on rocks.

Superfamily Corophioidea

Family Ampithoidae

Ampithoe dalli Shoemaker, 1938 (fig. 18.44). Intertidal and shallow subtidal; algae and eelgrass.
Ampithoe lacertosa Bate, 1858 (fig. 18.45). Intertidal and shallow subtidal; algae and eelgrass.
Ampithoe plumulosa Shoemaker, 1938 (fig. 18.46). Intertidal and shallow subtidal; algae and surfgrass; rare north of California.
Ampithoe sectimanus Conlan & Bousfield, 1982 (fig. 18.43). Low intertidal; exposed rocky beaches with algae.
Ampithoe simulans Alderman, 1936 (fig. 18.42). Low intertidal; various substrata, associated with algae and eelgrass.
Ampithoe valida Smith, 1873 (fig. 18.47). Low intertidal and shallow subtidal; usually on soft sediment with algae or eelgrass, somewhat estuarine.
Cymadusa uncinata (Stout, 1912) (fig. 18.41). Low intertidal and shallow subtidal; builds plant-debris nests at the base of boulders on exposed beaches, also associated with kelp and surfgrass.
Peramphithoe humeralis (Stimpson, 1864) (fig. 18.48). Low intertidal and subtidal; curls blades of kelp and eelgrass to form a tube.
Peramphithoe lindbergi (Gurjanova, 1938) (fig. 18.50). Low intertidal and shallow subtidal; eelgrass and algal holdfasts.

Peramphithoe mea (Gurjanova, 1938) (fig. 18.49). Subtidal; eelgrass.
Peramphithoe plea (Barnard, 1965) (fig. 18.51). Shallow subtidal; kelp holdfasts.
Peramphithoe tea (Barnard, 1965) (fig. 18.52). Intertidal and subtidal; algae.

Family Aoridae

Aoroides columbiae Walker, 1898. Low intertidal to deep subtidal; mixed sediment with algae.
Aoroides exilis Conlan & Bousfield, 1982. Low intertidal and subtidal; on various sediments, but especially with algae and eelgrass.
Aoroides inermis Conlan & Bousfield, 1982. Low intertidal and subtidal; sand.
Aoroides intermedius Conlan & Bousfield, 1982. Low intertidal and subtidal; sand and gravel, especially with algae and eelgrass.
Aoroides spinosus Conlan & Bousfield, 1982. Low intertidal and subtidal; on various substrata, especially with algae and debris.
Columbaora cyclocoxa Conlan & Bousfield, 1982. Low intertidal and subtidal; exposed rocky beaches with algae.

Family Cheluridae

**Chelura terebrans* Philippi, 1839. Associated with wood-boring isopods of the genus *Limnoria*; presence north of California not confirmed.

Family Isaeidae

[There are many taxonomic problems in this family, despite the useful paper of Conlan (1983).]
Cheirimedeia macrocarpa subsp. *americana* Conlan, 1983. Low intertidal; brackish and marine sandflats.
Cheirimedeia similicarpa Conlan, 1983. Subtidal; shelly sediments.
Cheirimedeia zotea (Barnard, 1962) (fig. 18.73). Low intertidal to deep; mixed sediments.
Gammaropsis ***(Gammaropsis) ellisi*** Conlan, 1983. Low intertidal and subtidal; on algae and sponges.
Gammaropsis ***(G.) shoemakeri*** Conlan, 1983. Low intertidal and subtidal; on algae and hydroids.
Gammaropsis ***(G.) spinosa*** (Shoemaker, 1942). Low intertidal and subtidal; on algae, sponges, and polychaete tubes.
Gammaropsis ***(G.) thompsoni*** (Walker, 1898). Low intertidal and subtidal; on various substrata, but especially among encrusting animals and in algal holdfasts.
***Gammaropsis** (Podoceropsis) barnardi* Kudryashov & Tsvetkova, 1975. Subtidal; mixed sediment, especially sand; not reported south of Vancouver Island.
***Gammaropsis** (P.) chionoecetophila* Conlan, 1983. Deep subtidal; commensal in egg masses of the crab *Chionoecetophila tanneri*; reported only from Alaska and Oregon.
***Gammaropsis (P.)** ociosa* (Barnard, 1962). Subtidal; sand and gravel; apparently synonymous with *Podoceropsis augustimana* Conlan, 1983.
Gammaropsis (P.) sp. A (was ?*Megamphopus* sp.) Low intertidal and subtidal; sand, possibly associated with eelgrass; an undescribed species referred to as "near *Podoceropsis inaequistylis*" by Staude *et al.*, 1977.
Photis bifurcata Barnard, 1962 (fig. 18.29). Intertidal to deep subtidal; usually on soft sediment.
Photis brevipes Shoemaker, 1942 (fig. 18.28). Low intertidal to deep subtidal; in various sediments, but especially sand.
Photis conchicola Alderman, 1936 (fig. 18.32). Intertidal and subtidal; rocky beaches with algae and surfgrass, often pagurid-like, living in empty gastropod shells; differing from *P. oligochaeta* only by its more setose coxae.
Photis lacia Barnard, 1962 (fig. 18.33). Subtidal; soft sediments.
Photis macinerneyi Conlan, 1983 (fig. 18.33). Low intertidal and subtidal; sand.
***Photis macrotica* Barnard 1962.** Subtidal to deep, soft sediments.
Photis oligochaeta Conlan, 1983 (fig. 18.32). Low intertidal and subtidal; sand and gravel; differing from *P. conchicola* only by its less setose coxae, a character which is size-related, according to Conlan (1983).
Photis pachydactyla Conlan, 1983 (fig. 18.30). Low intertidal and subtidal; hard substratum, and occasionally in empty barnacle shells.

Photis parvidons Conlan, 1983 (fig. 18.31). Low intertidal and subtidal; sandy sediment.
Protomedeia articulata Barnard, 1962. Low intertidal to deep subtidal; soft sediments.
Protomedeia grandimana Bruggen, 1905. Low intertidal to deep subtidal; soft sediments; not reported south of Vancouver Island.
Protomedeia penates Barnard, 1966 and *P. prudens* Barnard, 1960. Subtidal (sometimes deep); soft sediments; Conlan (1983) suggests that the 2 species are synonymous.

Family Ischyroceridae

Ischyrocerus anguipes (Krøyer, 1838) (fig. 18.36) group. Low intertidal and subtidal; tube-building on various substrata.
Ischyrocerus serratus Gurjanova, 1938 (fig. 18.39). In beds of *Mytilus californianus* on exposed rocky shores; assignment to genus doubtful.
Ischyrocerus sp. Low intertidal and subtidal; tube-building on various substrata.
***Jassa borowskyae* Conlan 1990**. Exposed rocky shores, on algae and surfgrass.
***Jassa morinoi* Conlan 1990**. Low intertidal, on rocks and algae.
***Jassa oclairi* Conlan 1990**. Low intertidal and subtidal, on algae and sponges.
***Jassa sbawi* Conlan 1990**. Low intertidal and subtidal, on hard substrate and sponges.
***Jassa slatteryi* Conlan 1990**. Low intertidal and subtidal, on algae and hydroids.
***Jassa staudei* Conlan 1990**. Low intertidal and subtidal, on rocks and algae.
***Microjassa barnardi* Conlan 1995**. Subtidal, soft sediment.
***Microjassa bousfieldi* Conlan 1995**. Subtidal to deep, soft sediment.
Microjassa litotes Barnard, 1954 (fig. 18.38). Subtidal, among small algae and in holdfasts.

Family Corophiidae

Corophium acherusicum Costa, 1857 (fig. 18.27). Intertidal and subtidal; tube-building on sediment, algae, and eelgrass.
Corophium baconi Shoemaker, 1934. Intertidal and subtidal; tube-building in soft sediment; reported from Bering Sea and California.
Corophium brevis Shoemaker, 1949. Intertidal and subtidal; tube-building on various substrata.
Corophium crassicorne Bruzelius, 1859. Subtidal; tube-building in soft sediment.
Corophium insidiosum Crawford, 1939. Intertidal and subtidal; tube-building in soft sediment.
Corophium salmonis Stimpson, 1857 (fig. 18.26). Intertidal and subtidal; tube-building in soft sediment, especially in estuarine situations.
Corophium spinicorne Stimpson, 1857. Intertidal and subtidal; tube-building in soft sediment, primarily in freshwater.
Ericthonius brasiliensis Dana, 1853. Subtidal; forming mats of muddy tubes on various substrata.
Ericthonius ***rubricornis*** *(Stimpson, 1853)* (was *hunteri*). Subtidal; forming mats of muddy tubes on various substrata.
**Grandidierella japonica* Stephensen, 1938. Intertidal and subtidal; soft-sediments; probably introduced with the oyster *Crassostrea gigas*.

Family Podoceridae

Dulichia spp. Shallow to deep subtidal; on various substrata, but especially epibiotic; undescribed species are to be expected.
Dulichia rhabdoplastis McCloskey, 1970. Subtidal; commensal on the spines of the sea urchin *Strongylocentrotus franciscanus* and also occurring on soft sediment.
Dyopedos spp. Shallow to deep subtidal; on various substrata, but especially epibiotic; undescribed species expected (see Laubitz, 1977).
Paradulichia typica Boeck, 1870 (fig. 18.79). Shallow to deep subtidal; on various substrata, but especially epibiotic.
Podocerus cristatus (Thomson, 1879) group. Subtidal; on various substrata, but especially epibiotic; until this group is revised, Barnard (1979) hesitates to identify species unless they have been collected at the type localities.

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[1] Staude, C.P., 1987. Suborder Gammaridea. pp. 346-386. In: E.N. Kozloff (ed.), Marine Invertebrates of the Pacific Northwest. Univ. Washington Press, Seattle.

[2] Bousfield, E.L., 1983. An updated phyletic classification and paleohistory of the Amphipoda. *In* Schram, F. R. (ed.), Crustacean Phylogeny. Rotterdam: Balkema, pp. 257-77.

[3] See bibliography of recent taxonomic literature (next page)

Request for Feedback

I am eager to receive comments, additions, or corrections to this species checklist. To encourage wide response, it is my intention to post this list on the Internet, linked to home page of the Friday Harbor Laboratories at http://www.fhl.washington.edu.

You may respond via e-mail (staude@fhl.washington.edu) or by mail:

Dr. Craig P. Staude
Friday Harbor Laboratories
University of Washington
620 University Road
Friday Harbor, WA 98250 USA

Readers may also benefit from reference to the following gammaridean papers included in the **Taxonomic Atlas** of the Santa Barbara Museum of Natural History, although they fail incorporate most of the new taxa listed above:

Conlan, K.E., 1995. Superfamily Corophioidea. pp. 177-222, *In:* J.A. Blake, L. Watling, and P.H. Scott (eds.), Taxonomic Altas of the Santa Maria Basin and Western Santa Barabara Channel, Vol. 12, The Crustacea Part 3, Santa Barbara Mus. of Natural Hist., Santa Barbara, CA.

Thomas, J.D., & L.D. McCann, 1995. The families Argissidae, Dexaminidae, Eusiridae, Gammaridae, Leucothoidae, Melphidippidae, Oedicerotidae, Pardaliscidae, Phoxocephalidae, Podoceridae, Stegocephalidae, Stenothoidae, Stilipedidae, Synopiidae, and Urothoidae. pp. 21-136, *In:* J.A. Blake, L. Watling, and P.H. Scott (eds.), Taxonomic Altas of the Santa Maria Basin and Western Santa Barabara Channel, Vol. 12, The Crustacea Part 3, Santa Barbara Mus. of Natural Hist., Santa Barbara, CA.

Watling, L., 1995. The families Ampeliscidae, Amphilochidae, Liljeborgiidae, and Pleustidae. pp. 137-176, *In:* J.A. Blake, L. Watling, and P.H. Scott (eds.), Taxonomic Altas of the Santa Maria Basin and Western Santa Barabara Channel, Vol. 12, The Crustacea Part 3, Santa Barbara Mus. of Natural Hist., Santa Barbara, CA.

_____, & J.D. Thomas, 1995. Introduction to the Amphipoda. pp. 1-20, *In:* J.A. Blake, L. Watling, and P.H. Scott (eds.), Taxonomic Altas of the Santa Maria Basin and Western Santa Barabara Channel, Vol. 12, The Crustacea Part 3, Santa Barbara Mus. of Natural Hist., Santa Barbara, CA.

Recent taxonomic literature on the northeast Pacific boreal Gammaridea [not in Kozloff's Keys (Staude, 1987)]

Barnard, J.L., & C.M. Barnard, 1981. The amphipod genera *Eobrolgus* and *Eyakia* (Crustacea: Phoxocephalidae) in the Pacific Ocean. Proc. Biol. Soc. Wash. 94: 295-313.

_____, & _____, 1982. Revision of *Foxiphalus* and *Eobrolgus* (Crustacea: Amphipoda: Phoxocephalidae) from American oceans. Smith. Contrib. Zool. 372: 1-35.

_____, & G.S. Karaman, 1991. The families and genera of marine gammaridean Amphipoda (except marine gammaroids). Records of the Australian Museum, Supplement 13, Part I (pp.1-417) and Part II (pp.419-866).

Bousfield, E.L., & E.A. Hendrycks, 1994. The amphipod superfamily Leucothoidea on the Pacific coast of N. America. Family Pleustidae: Subfamily Pleustinae. Systematics and biogeography. Amphipacifica 1(2): 3-69.

_____, & _____, 1995a. The amphipod superfamily Eusiroidea in the North American Pacific region. I. Family Eusiridae: systematics and distributional ecology. Amphipacifica 1(4): 3-59.

_____, & _____, 1995b. The amphipod family Pleustidae on the Pacific coast of North America: part III. Subfamilies Parapleustinae, Dactylopleustinae, and Pleusirinae. Systematics and distributional ecology. Amphipacifica 2(1): 65-133.

_____, & P.M. Hoover, 1995. The amphipod superfamily Pontoporeioidea on the Pacific coast of North America. I. Family Haustoriidae. Genus *Eohaustorius* J.L. Barnard: systematics and distributional ecology. Amphipacifica 2(1): 35-63.

_____, & Z. Kabata, 1988. Amphipoda, *In:* L. Margolis and Z. Kabata (eds.), Guide to the Parasites of Pacific Fishes of Canada. Part II. Crustacea. Canadian Spec. Pub. Fish. Aquat. Sci. 101: 149-163.

_____, & J.A. Kendall, 1994. The amphipod superfamily Dexaminoidea on the North American Pacific Coast; Families Atylidae and Dexaminidae: Systematics and dstributional ecology. Amphipacifica 1 (3): 3-66.

_____, & C.-t. Shih, 1994. The phyletic classification of amphipod crustaceans; problems in resolution. Amphipacifica 1(3): 76-134.

_____, & C.P. Staude, 1994. The impact of J.L. Barnard on North American Pacific amphipod research: a tribute. Amphipacifica 1(1): 3-16.

Conlan, K.E., 1990. Revision of the crustacean amphipod genus Jassa Leach (Corophioidea: Ischyroceridae). Canadian J. Zool. 68(10): 2031-2075.

_____, 1995. Thumbing doesn't always make the genus: revision of *Microjassa* Stebbing (Corophioidea: Ischyroceridae). Bull. Marine Sci. 57: 333-377.

Coyle, K.O., 1982. The amphipod genus *Grandifoxus* Barnard (Gammaridea: Phoxocephalidae) in Alaska. J. Crust. Biol. 2(3): 430-450.

Jarrett, N.E., & E.L. Bousfield, 1994a. The amphipod superfamily Phoxocephaloidea on the Pacific coast of North America. Family Phoxocephalidae. Part I. Metharpiniidae, new subfamily. Amphipacifica 1(1): 58-140.

_____, & _____, 1994b. The amphipod superfamily Phoxocephaloidea on the Pacific coast of North America. Family Phoxocephalidae. Part II. Subfamilies Pontharpiniinae, Parharpiniinae, Brolginae, Phoxocephalinae, and Harpiniinae. Systematics and distributional ecology. Amphipacifica 1(2): 71-150.

Meyers, A.A., & D. McGrath, 1984. A revision of the north-east Atlantic species of *Ericthonius* (Crustacea: Amphipoda). J.mar. biol. Ass. U.K. 64: 379-400.

Moore, P.G., 1992. A study on amphipods from the superfamily Stegocephaloidea Dana 1852 from the northeastern Pacific region: systematics and distributional ecology. J. Nat. Hist. 26: 905-936.

Staude, C.P., 1995. The amphipod genus *Paramoera* Miers (Gammaridea: Eusiroidea: Pontogeneiidae) in the eastern North Pacific. Amphipacifica 1(4): 61-102.

SCAMIT CODE: None

Date Examined: 1 February 1996
Voucher By: Tim Stebbins & Dean Pasko

SYNONYMY: *Aoroides* sp A (MEC) & *Aoroides* sp SD1 (City of San Diego, Pt. Loma)

LITERATURE:

Barnard, J.L. 1970. Sublittoral Gammaridea (Amphipoda) of the Hawaiian Islands. Smith. Cntr. Zool. No. 34.

Conlan, K.E. and E.L. Bousfield. 1982. The amphipod superfamily Corophioidea in the northeastern Pacific region: 2. Family Aoridae. Systematics and distributional ecology. Natl. Mus. Nat. Sci. (Canada) Publ. Biol. Oceanogr., 10(3): 77-101.

DIAGNOSTIC CHARACTERS:

1. Body white, pigment absent.

2. Uropod 2 with minute antero-distal process ($\leq$ 1/10$_{th}$ the length of rami).

3. Gnathopod 1, article 2 (basis) with long, widely spaced setae, and dorsal margin of article 5 (carpus) without setae (except for 1 distal group).

4. Mandibular palp, article 2 bare.

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. See Table 1 for comparisons of *Aoroides* sp A with *A. columbiae, A. exilis, A. inermis, A. intermedia, and A. spinosa.*

2. *Aoroides nahili* and *A. secundus* differ from *Aoroides* sp A in missing a distal process on the peduncle of uropod 2. Consequently, these two species are differentiated from *Aoroides* sp A in the first couplet of the *Key to North Pacific Species of Aoroides* (Conlan and Bousfield, 1982), and are not considered in the table.

DEPTH RANGE: 200-350 ft.

DISTRIBUTION: Southern California: Palos Verdes, Los Angeles to Point Loma, San Diego.

A. *Aoroides* sp A. uropod 2, ventral view (modified from Barnard, 1970, figure 32b, *Aoroides columbiae).*

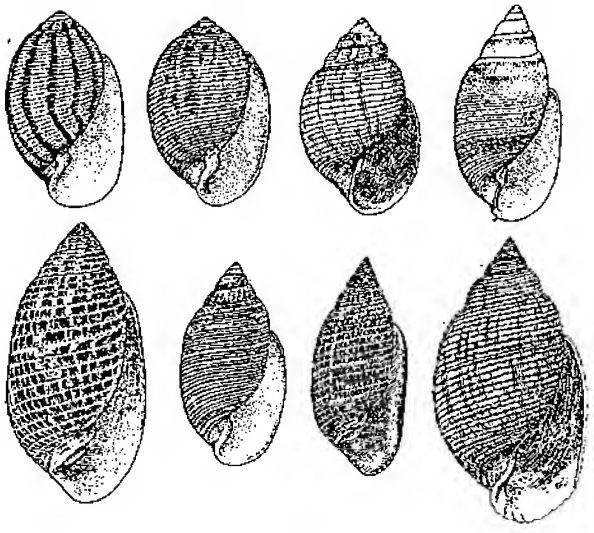
Table 1. Comparison of characters of *Aoroides* spp from southern California.

	columbiae	exilis	inermis	intermedia	spinosa	Sp A
Mandibular palp, article 2 (1) setose	X		X	X		
(2) bare		X			X	X
Male gnathopod 1, article 2 (1a) posterior margin setose		X			X	
(1b) posterior margin bare	X		X	X		X
(2a) anterior margin densely setose (long setae)	X	X	X	X		long & widely spaced
(2b) anterior margin weekly setose (short setae)					X	
Male gnathopod 1, article 5 (1a) broader than article 2	X	X			X	X
(1b) not broader than article 2			X	X		
(2a) dorsal margin setose, with 8-15 setal bundles			X			
(2b) dorsal margin setose, with 5-7 setal bundles				X		
(2c) dorsal margin not setose, (except for 1 distal group)	X	X			X	X
Peraeopod 7, article 2 (1) broad (W/L $\geq$ 50%; ~60%)	~53%		~50%	~60%	~56%	*
(2) slender (W/L << 50%; ~40%)		~39%				
Uropod 2, peduncle antero-distal process (1) long (≥ 1/2 length of rami)	X	X				
(2) short (<< 1/2 length of rami)			X	X	X	minute
Uropod 3, outer ramus (1) 1-3 "strong" spines		X			X	
(2) usually bare, or with 1-2 "small" spines	X		X	X		X
Body pigmentation (1) bands	X	X				
(2) speckled			X	X	X	
(3) no pigment (white)						X

* The size and shape of peraeopod 7, article 2 (basis) is unknown because no specimens have been collected with P7 attached.

March, 1996 SCAMIT Newsletter Vol. 14, No.11

NEXT MEETING:	Cephalaspid Mollusks
GUEST SPEAKER:	John Ljubenkov and Don Cadien
DATE:	April 22, 1996
TIME:	9:30am - 3:30pm
LOCATION:	Natural History Museum of Los Angeles 900 Exposition Blvd., Los Angeles



Shells of eight cephalaspid species from Japan (Habe, T. 1950. Pupidae in Japan. Illustrated Catalogue of Japanese Shells 6:39-44)

APRIL 22 MEETING

This meeting is the first of two this year to discuss the gastropod mollusks in the order Cephalaspidea. This preliminary meeting is to present the group, to gather information on problem areas participants find in dealing with the group, and to distribute materials to be evaluated and modified for the second meeting. By that time several new mollusk references should be available, and can be integrated into our conception of the group. This second meeting will be led by Dr. Terry Gosliner of the California Academy of Sciences. Participants in both meetings should bring not only problem animals, but examples of taxa they encounter in their programs. Examples of other species will be drawn from the collections of the Natural

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SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

History Museum of Los Angeles County to better prepare us to recognize these animals in the future.

ELECTION

The election results are in. All of the current SCAMIT officers have been re-elected. Members should keep in mind nominations for next year because some of the incumbents will most likely not be running for election.

MEREDITH JONES

It is with great sadness that we report the loss of taxonomist Meredith Jones. He had been ill for some time with cancer. His earlier work with magelonid polychaetes and his later work with the vestimentiferan *Riftia* provided major contributions to invertebrate biology. He will be sadly missed by all in his field. Those wishing to make a memorial donation may send a gift to the San Juan County Library c/o of his wife, Mrs. Gerry Jones, 2283 Mitchell Bay Rd., Friday Harbor, WA 98250. This was his wish because the library had provided him with taped books during the later stages of his illness.

NEW LITERATURE

A sizeable new paper dealing with Caribbean sea cucumbers (Cutress 1996) should also be carefully examined by all us west coasters who deal with holothuroids. It details changes in dermal ossicles with growth in twelve species of aspidochirotes. The nature of, and variability in, ossicle change with growth documented for Caribbean species in this paper bear on our fauna as well. Cases where ossicle types appear with growth, are lost with growth, and change with growth are all discussed and illustrated.

In a continuation of the phylogenetic arguments ongoing over Nemertea Sundberg and Hylbom (1996[for 1994]) discuss the Palaeonemertea. They utilized 49 of 98 described species and six undescribed species in their study. Of the 54 species, 35 were incompletely described for the characters used in the parsimony analysis and were excluded. Their analysis yielded some very complex character transformation series, with multiple reversals. Several currently recognized genera were indicated as paraphyletic by the analysis. As an appendix to the paper the authors provide a status update on the described species within the group.

The polychaete subfamily Amphitritinae has also recently received phylogenetic analysis (McHugh 1995). This new analysis did not substantiate any of the tribes recognized in the recent monographic review of the Terebellomorpha (Holthe 1986). It forms the basis for future realignment of genera within the group. Based on the analysis the Artacaminae were submerged within the Amphitritinae.

The taxonomy of the pyramidellid mollusks has always been controversial. They are parasitic, which leads to a high degree of convergence in their characters. They are intermediate between prosobranchs and opisthobranchs, having characteristics of both. They have had hundreds of species described on shell characters alone, without much information available on the animals themselves. Wise (1996) has recently added substantially to the meager information base on the morphology of pyramidellids. He also performed a cladistic analysis of the group, utilizing both shell and anatomical characters. Existing evidence suggests that the subfamily Turbonillinae is paraphyletic, but that the other currently recognized subfamilies (Odostomiinae, Pyramidellinae, and Cyclostremellinae) are probably not. They are each defined in the paper by synapomorphies. Wise also erects the subfamily Sayellinae, and several new genera.

MALACOLOGISTS MEETING

The Western Society of Malacologists will hold its annual meeting in San Diego this year. The dates set for this meeting are June 23rd thru the

27th. Members interested in attending should refer to the flyer included with this newsletter for further details.

SCBPP *Philine*

Contrary to initial report, and all our beliefs, the New Zealand snail invading our local waters had begun to show up during the July-August 1994 SCBPP sampling. A small specimen returned from the trawls for laboratory identification has proven to be *P. auriformis* rather than *P. alba* as originally thought. The specimen was taken on 24 July 1994 at SCBPP station 0537 off Ventura, at a depth of 43m. No *P. auriformis* were taken during the SCBPP benthic sampling or prior to February 1995 elsewhere in the Bight.

Octopus veligero STILL AROUND

In trawls off Palos Verdes in February one more *O. veligero*, a male, was taken by CSDLAC. It was somewhat net-damaged, and could not be induced to flash its lateral brown spots. Because of its relatively short arms it was not considered to be *O. rubescens*, and it lacked the orange ground color and stellate mantle papillae of *O. californicus*. It was characterized as *Octopus sp.* in the field, and as *O. veligero* based on gill count in the lab. Seven *O. rubescens*, four ♀ and three ♂, were also taken in the trawl which yielded the *O. veligero*.

VARIABILITY IN SHRIMP

Dr. Mary Wicksten has once again taken time from her busy schedule to drop us a helpful line. She sent along a series of guidelines on the types of morphological variability we may expect to see in local shrimp (attached). This is a question she has been devoting considerable time to as part of her reexamination of the California shrimp fauna. Her investigations have led to the synonymization of several local species when separatory characters proved unreliable due to their variability. Our thanks to Mary for sharing this hard-won experience with us.

SCAMIT TAXA LIST

The second edition of the SCAMIT Taxa list is now out and, typically, we have already found several errors. They will be corrected in the third edition of the taxa list. However, we have decided to inform members of spelling errors as we are made aware of them because some people are using this list to create their own species lists and we don't want misspellings to be perpetuated. So far we have noted three. They are:

The gastropod *Kelletia kelletti* (line 557) should be *Kelletia kelletii*. Please refer to the write up later in this newsletter that explains this change.

The annelid *Pseudoathrospio fauchaldi* (line 1171) should be spelled *Pseudatherospio fauchaldi*. The letter "o" was added and the letter "e" was omitted from the name on the list.

The decapod *Polyonyx quadriunguiculatus* should be spelled *Polyonyx quadriungulatus* as per the original description of Glassell (1935).

Please feel free to contact the editors, Dave Montagne (CSDLAC) and Ron Velarde (CSDMWWD) with any corrections, misspellings or suggestions you may have for edition 3. It is anticipated that the third edition will list partial synonymies for the species it includes.

COSMOPOLITAN SPECIES

A recent e-mail message was received thru the Annelida usegroup from Judith Fournier of the Canadian Museum of Nature. In it Judith makes a valid point about the presence of cosmopolitan species. In her message she refers to a previous message that was forwarded to Annelida about *Nereis acuminata* collected in Long Beach Harbor and used to grow a culture from which

four pairs were transferred to the Woods Hole Oceanographic Institute. Judith assumes that these worms were the lab cultures of *Neanthes arenaceodentata* first developed by Dr. Don Reish. The name *Neanthes arenaceodentata* was mistakenly applied to these west coast specimens for many years. However, *Neanthes arenaceodentata* is a New England endemic species and Pesch *et al* (1988) showed that the Maine and California worms have different chromosome complements and cannot be the same species. The name *Nereis acuminata* is also most likely invalid for this west coast species since it was described by Day (1973) from North Carolina. Judith recommends that there be a thorough review of the *Nereis* and *Neanthes* species of California and that the Woods Hole specimens be compared to specimens of *N. arenaceodentata* from New England. She also believes that more care should be taken when making the assumption that various populations of a species are cosmopolitan, when in fact they are two different species. This problem of two "cryptic" species looking very similar morphologically, but occurring in two different locations, and the assumption of a species being cosmopolitan in its habitat, is probably a much more common practice than believed.

This has also been the case for the polychaete species *Paraprionospio pinnata*. During the SCBPP this species was reported not only from all different depths, but also from all different habitats by many of the taxonomists involved with the project. This is also the only species included on the SCAMIT Taxa List and the only *Paraprionospio* reported by local monitoring programs. A table of *Paraprionospio* species with their diagnostic characters, as taken from the literature, was provided by Leslie Harris at the March meeting. Members should use this table to review and compare their own specimens of *Paraprionospio pinnata* to see if perhaps this species is not as cosmopolitan as believed. Due to incompatible computer file formats we are unable to include this table in this newsletter, but will try to include it in next month's newsletter.

MINUTES OF MARCH 11 MEETING

At this polychaete meeting Larry Lovell made a request for specimens of *Nephtys cornuta* that have interramal cirri beginning on segment 6, rather than 5. Larry commented that often the interramal cirrus is reduced on setiger 2 and may be missed when counting segments to determine where the interramal cirrus begins in nephtyids. Larry also drew members attention to Hilbig's illustration of *Nephtys cornuta* on pg. 349 of volume 4 of the MMS Atlas. In figures B, C, and D Hilbig illustrates the variability of the ventral antennae of the prostomium where the 2nd condition (fig. C) is a reduced state and the 3rd condition (fig. D) is more of a swelling. Please refer to the "remarks" section on pg. 350 for more of an explanation on this variability.

The first half of the meeting began with a discussion of the Volume 5 of the MMS Atlas. We reviewed all the chapters except the Lumbrineridae, which we had discussed at the February meeting. Noted below are some of the comments that were made.

Exogone dwisula pg. 17

This new species is the same as *Exogone sp. B* of SCAMIT.

Exogone acutipalpa pg. 22

This new species is the same as *Exogone sp. D* of Harris.

Exogone lourei pg. 15

Exogone sp. A of SCAMIT appears to be this species. Sp. A was originally established by Sue Williams, and was characterized as being identical to *E. lourei* except for the absence of thick-shafted spinigers on setiger 2. Leslie Harris has re-examined specimens identified by Sue and found that in almost all cases the thick-shafted spinigers were present but had been retracted into the parapodial lobes and were very difficult to see; the remaining specimens belonged to species other than *E. lourei*.

As noted in the remarks, 100 specimens of *E. lourei* were examined by Leslie to establish variation in certain morphological or developmental characters. She noted length and location of the proventriculus, number of muscle cell rows, first occurrence of the superior dorsal simple seta, antennae size, and location of natatory setae and gametes. The holotype and paratypes of *Exogone uniformis* Hartman were examined as well. All of the paratypes of *E. uniformis* were found to fall well within the median range of variation for *E. lourei*. The holotype of *E. uniformis* overlaps the upper end of variation for *E. lourei*, differing only in the length of the median antenna. She is keeping *E. uniformis* as a valid species, with the holotype as the only known specimen. This may change after study of additional material. Reports of *E. uniformis* by SCAMIT members should be regarded with suspicion.

Eusyllis blomstrandi pg. 41

Please note the "remarks" section. Leslie does not believe that this species occurs on this coast. If anyone has specimens of *E. blomstrandi* please send them to Leslie for examination.

Sphaerosyllis californiensis pg. 29

The figure 1.8 A has erroneously illustrated dorsal cirri on setiger 2. The description on pg. 30 describes them as being absent on setiger 2.

Eusyllis habei pg. 43

This species is easily distinguished from other local species by the presence of enlarged ventral cirri on setiger 1. Please be aware that Leslie has found additional undescribed species of *Eusyllis* and *Pionosyllis* which also have enlarged ventral cirri on setiger 1. These can be separated from *E. habei* by setal morphology. If anyone finds some of these other specimens, please send them to Leslie.

Odontosyllis pg.47

Odontosyllis californiensis (Chamberlin 1919) n. com. Kudenov and Harris 1995 was not included in the key. It differs most noticeably from the others in setal morphology. The secondary tooth is large, subequal to the distal tooth, and located at the midpoint of the cutting edge of the blade. Setae of all other described Pacific northwest *Odontosyllis* have a secondary tooth which is smaller than and located just below the primary tooth. Leslie is describing two additional species. One is found in rocky and soft-bottom shallow habitats from Point Conception to Santa Monica Bay (many specimens have been found by Tony Phillips, City of LA), and has three dark vertical stripes on the anterior and median dorsum (the lines may be broken into individual spots in the median region). The other species has been collected only from lower intertidal *Phragmatopoma* reefs in Santa Monica Bay; the prostomium, antennae, cirri, and parapodia are bright white, the eyes are bright red, and the dorsum is iridescent blue-black.

Syllides reishi pg. 59

Reports by SCAMIT members of this species are probably incorrect. Leslie examined specimens from soft-bottom stations taken in the BLM survey, MMS Phase I & II, Santa Monica Bay, Orange County, San Diego County, and other areas, and found only *Syllides mikeli*. *S. reishi* was described from intertidal coralline algae mats at San Clemente Island; it has also been found in LA Harbor rip-rap, intertidal and shallow subtidal algal mats from Catalina and the mainland, and in kelp holdfasts from shallow water. The two species do not appear to co-occur.

Typosyllis alternata pg. 83

Since publication, Leslie has changed her mind about this species and is doubtful about the correctness of identification. Our specimens have extremely large aciculae which were not mentioned in Moore's (1908) original description. Cynthia Stonick (Washington State Department of Ecology) is currently comparing our animals with *T. harti* (Berkeley and Berkeley 1938).

A major problem exists in the identification of *Typosyllis*. One of the main characters used in keys is the number (or range) of articles in the antennae and dorsal cirri. Unfortunately, we do not have enough information on the development of the antennae and dorsal cirri to know at what size an animal stops adding articles, or if they do. If we have a non-reproductive animal with 30 dorsal articles, how can we know if it is a juvenile of a species that will eventually have 70 articles or if it is an adult with its maximum number of articles? Clearly some species, such as *T. farallonensis* Blake and Walton 1977, characterized by an average of 3-4 articles in the dorsal cirri, do have a maximum number of articles which is developed early in life. It is less clear if a species like *T. pulchra* (Berkeley and Berkeley 1938), said to have up to 70 articles per dorsal cirrus, develops the full number while a juvenile or if the number of articles gradually increases with the size of the animal. Until we learn the minimum size at which each species attains the adult number of articles (if indeed there is an maximum number/range), or unless we stop using the number of antennae and dorsal articles as a species-level character, we will never be certain of our identifications. An additional problem in identifying local species is their size. Our animals are almost always much smaller than the specimens in descriptions (*T. farallonensis* being the exception), leading to similar uncertainty: if the number of articles and other characters match the description of a particular species but the animal is 1/5 the size of the type, is it really the same species or could it be the juvenile (or the adult) of another species?

Leslie's current approach to identifying *Typosyllis* is to avoid specific names unless the animal matches in all details (including size) the original description or one based on re-examination of the type. Otherwise the specimen gets a letter designation and characters are recorded in a database for future analysis.

Aphroditidae

Members working with aphroditids should still follow Mark Rossi's key from 1978. He not only examined many local specimens, but he also examined type specimens.

Included with this newsletter is a copy of Rossi's key from 1978, which was distributed thru the SCCWRP Taxonomic Standardization Program, but never SCAMIT.

Aphrodita parva pg. 102

This species is probably a juvenile form. No one has ever reported seeing a reproductive specimen of *A. parva*.

Leslie commented that the common animals we identify as *Aphrodita japonica* probably represent a complex of several species.

Lepidonotus spiculus pg. 142

This is both a new combination and the revalidation of a species that was previously synonymized under *Lepidonotus caelorus* Moore 1903 and *Lepidonotus squamatus* (Linnaeus 1767). *L. spiculus* and *L. squamatus* co-occur along the Pacific Rim, so great care should be used in keying out individuals from southern California.

Ysideria hastata pg. 158

This is *Harmothoe* sp. A of SCAMIT.

It was decided at this meeting that we need a SCAMIT meeting devoted to *Malmgreniella* species. Gene Ruff has agreed to lead one, tentatively scheduled for September. Members may want to start gathering problem specimens now. Leslie will collect the specimens at the May meeting for shipment to Gene.

Sigalionidae pg. 191

There is a mistake in the key. Line 7B should go to couplet 8 not 7.

Sthenelais berkeleyi

Both this and the closely related *S. fusca* are papillated. The difference is in the degree of papillation, according to Leslie. Specimens of this species have a densely papillated ventrum similar to flabelligerid dermis, and is somewhat rusty in color; the papillae are obvious under a dissecting scope. The papillae of *S. fusca* are very small and sparse, and noticeable only when using a compound scope to view a parapodia.

Onuphis iridescens pg. 253

In the "remarks" section Hilbig makes the comment that specimens should only be identified to species level if they are at least 60 setigers long and 0.6 mm wide. SCAMIT members have often discussed the fact that onuphids have diagnostic characters that are growth dependent. The problem in the past for SCAMIT has been deciding what size range constitutes a juvenile form.

Onuphis sp. "intermediates" pg. 255

This is the same as *Onuphis* sp. 1 of Pt. Loma on the SCAMIT Taxonomic List.

Family Oenonidae

SCAMIT is currently retaining the old name Arabellidae. A meeting on this and the genus *Drilonereis*, especially our parasitic form of *D. longa*, is being scheduled for the near future. In the meantime, we have decided to use an emended version of Fauchald's 1970 key for the genus instead of the one by Hilbig. Hilbig's key to species of *Drilonereis* begins with the choices of acicular spines present from setiger 1 or from after setiger 10, and if the posterior parapodia are bilabiate or not. The first occurrence of the acicular spine is variable (see Leslie's remarks under *falcata*, below) and most specimens are fragmented, making the character of the posterior parapodia useless.

Emended key to *Drilonereis*, from Fauchald 1970

1. Maxillae I proximally dentate.....2
1. Maxillae I proximally smooth.....4
2. Mandibles present.....3
2. Mandibles absent.....*mexicana*
3. Maxillae I with 2-3 large basal teeth; maxillae II with 3-4 large teeth; if present, posteriormost parapodia bilabiate.....*nr. longa*
3. Maxillae I with 3-4 large basal teeth; maxillae II with 6-9 large teeth; postsetal lobes shorter or equal in length to parapodial base throughout body.....*falcata*
3. Maxillae I with 4 large & 2-3 small basal teeth; maxillae II with 6-8 large & 3 small teeth; postsetal lobes conspicuous, digitiform to almost foliaceous after setiger 70.....*spectabilis*
4. Mandibles present.....*?filum*
4. Mandibles absent.....5
5. Maxilla II dentate.....*nuda*
5. Maxilla II smooth.....*forcipes*

Drilonereis falcata pg. 328

The occurrence of the first acicular spine is variable, according to Leslie. She has examined type as well as other material. It is emergent on setiger 10 in the holotype but may have been broken off in earlier setigers; present on setiger 8 in the paratype; first present from setiger 1 to setiger 13 in material from Monterey Bay (the type locality), southern California Bight, and off the Channel Islands.

Drilonereis longa pg. 331

Leslie examined the type material in 1987. The "holotype" lot (USNM 540, from Great Egg Harbor, New Jersey) consists of four anterior ends and 1 median fragment; there are no posterior ends included. Webster (1879) shows approximately 8 teeth on maxillae II, which is what Leslie found on type material. In contrast, Hilbig reports 3-4 large teeth, similar to what we have seen previously in the local *D. nr. longa*. There are other discrepancies in tooth structure as well. This difference, along with the fact that most of our *D. nr. longa* are parasitic, living within what was formerly called *Tharyx*, leads us to believe that it is a distinct species. Please note that the illustrations in Hilbig are taken from Gulf of Mexico and east coast specimens, and that fig. 12.6 D is of a median parapodia, not a posterior parapodia as labelled.

Family Dorvilleidae

Based on Hilbig's key, the City of San Diego's polychaete taxonomists believe they have been misidentifying *Dorvillea (Schistomeringos) annulata* as *D. (S.) longicornis*. In their animals the dorsal cirrostyles are as long as the dorsal cirrophores, a character of *D. annulata*. Both Hyperion and CSDLAC report specimens of *D. longicornis* that have much shorter and slightly inflated cirrostyles.

After lunch Dr. Kirk Fitzhugh treated SCAMIT members to a computer slide show of a new sabellid genus and species that he is currently working on. The computer graphics included many SEM illustrations of this unique sabellid that burrows into the shells of red abalone, *Haliotis rufescens*. The sabellid inhabits burrows in the abalone shell. The presence of the worm has been shown to directly impede normal shell growth, causing shells to have a nearly cup-shaped appearance. These infected abalone have been found in a number of the mariculture farms along southern California. The sabellid is a simultaneous hermaphrodite, which apparently had been imported from South Africa several years ago in association with *Haliotis midae*. A graduate student at UC Santa Barbara is currently studying the interactions between the worms and abalone.

The rest of the afternoon was spent discussing and examining some problem pilargids. We began with *Ancistrosyllis*. There are currently 3 species which have been reported locally and they appear on the SCAMIT Taxa list as *Ancistrosyllis breviceps, A. groenlandica,* and *A. hamata*. Leslie commented that the start of the ventral cirri is the best way to separate *A. hamata* from *groenlandica* and *breviceps* (setiger 3 versus setiger 1), while the latter two can be separated by the start of the hooked setae (setiger 4-6 versus 13-18). Also, both *breviceps* and *hamata* are deep water species, which she believes are not seen by local sampling programs. Most of what we see is similar to *A. groenlandica*. Our common local species does not exactly match either the original description (McIntosh 1879) or specimens from Greenland seen by Leslie. Until the type specimen can be borrowed and compared to southern California material, we prefer to use *A. cf. groenlandica.*

The next problem pilargids discussed were *Parandalia ocularis* and *Parandalia fauveli*. The following article by Tom Parker (CSDLAC) explains the situation.

All eyes are on *Parandalia ocularis*

Reports of both *Parandalia ocularis* and *Parandalia fauveli* are occasionally made from local benthic sampling. Typical separation between these taxa has been based upon the presence or absence of a pair of subdermal eyes in the anterior end of specimens. These "eyes" are actually nerve ganglia associated with the brain. The presence of "eyes" is often difficult to determine as the subdermal ganglia may not be dark enough to view through the skin. In specimens recorded as lacking "eyes", re-examination by dissection of the anterior end or careful squeezing and rolling of the specimen will often reveal the ganglia.

Another reported difference between these species is the number of neurosetae in posterior fascicles. *P. ocularis* is listed as having 7 setae, while *P. fauveli* has up to 16 setae. These setae are covered with circlets of fine barbs. Close observation and manipulation of these setae demonstrate that many setae will lock into each others axis-on-axis. Two such setae will appear as one. The result is an actual miscount of the number of setae in the bundle. It is not uncommon for specimens with "eyes" (*ocularis* condition) to also possess up to 16 neurosetae (*fauveli* condition).

Heavy anterior notospines are also reported for both species. The start of these notospines is listed as setiger 9 for *P. ocularis*, while *P. fauveli* is described as beginning on setiger 7. These spines are thick and massive but are nearly clear in appearance and difficult to see when

emergent from the body wall. Non-emergent notospines or those broken at the dermis level are extremely difficult to detect.

Several specimens collected by CSDLAC have been found in delicate clear tubes (see holotype condition below). At least one (RV0791-1D4) has been found almost entirely within this very clear tube. The tube could be mistaken for a *Spiochaetopterus* tube but the walls are extremely clear, delicate, and with weak or no annulations.

The holotype (USNM 32891) was examined in 1993 and found to be in the following condition:

The holotype is a specimen about 80mm in length and 0.9mm in width. It is broken into three pieces and is strongly curled. The prostomium was previously dissected through the first 8-9 segments. Parapodia number 3 has been removed on one side. The middle segments of the specimen are encased in a closely adhering parchment-like tube. There appear to be some "annulations" on this tube. The tube is separating at these locations. Epidermis is light greenish-yellow. It is flecked with reddish iridescence. This iridescence is not visible when viewed only with substage light. There are no "eyes" apparent either dorsally, ventrally, or viewed through dissection cut. It does have two bulbous structures in head region on either side of pharynx. Though not darkly pigmented, these structures resemble the "eyes" of *P. ocularis*. One is larger, while the other may be partly cut away and is considerably smaller. These possibly are nerve tissue or ganglia that could be interpreted as "eyes" on other specimens. First crystalline simple setae begin on segment 8. Neurosetae up to at least 12 setae in each parapodia. Setae are closely held together along their length so that shafts appear as single. When viewed under the compound scope, they can be seen as double.

There are published descriptions and keys for these taxa (Emerson and Fauchald 1971, and Salazar-Vallejo 1990). Each of these emphasizes the "eyed" condition and/or the neurosetal count. Unfortunately the type material used to erect the species *P. ocularis* is not available. Whether these specimens can later be located is unknown. Specimens have been collected that clearly possess "eyes", but possess up to 16 neurosetae. The species *P. ocularis* is apparently a species based on incorrect diagnosis of "eyes" and neurosetal count. It is recommended that occurrences of *P. ocularis* be synonymized to *P. fauveli*.

The next problem pilargids discussed at the meeting were *Pilargis maculata* and *Pilargis berkeleyae*. Please refer to the "remarks" section on pg. 280 of vol. 4 of the MMS Atlas. The main distinctions between these two species is the degree of body papillation and the shape of the dorsal cirri. The problem has been the confusion over the degree of papillation on the bodies of these two species. Again, Tom Parker provides us with some insight into this problem with the following article.

Dense Papillae, Dense Terms, Density of a Species Concept

During the creation of the first SCAMIT Taxonomic list, the synonymy of *Pilargis maculata* by Pettibone to *Pilargis berkeleyae* was noted and accepted. The name *P. maculata* did not appear in the first SCAMIT list and was not included in the recently released edition 2.

A variable concept of papillae density has crept into these definitions. Monro (1933) originally described *P. berkeleyae* as having its "back and feet studded with sparse papillation". Hartman in 1947 redescribed this species from various material including material from the type locality. She listed it as being finely papillated and illustrated this condition. Though the papillae are numerous on the dorsum, they appear small and individually separate from one another. Her original description and detailed illustration of *P. maculata* lacks dorsal papillae. Her illustration should be consulted. Pettibone in 1966 redescribed *P. berkeleyae* and synonymized

P. maculata to this taxa and noted that papillae were "more numerous dorsally". In 1987 Imajima produced illustrations of *P. berkeleyae* with the entire dorsum "finely papillated". In 1994 the MMS atlas volume No.4 was released and included a description, as valid taxa, of both *P. berkeleyae* and *P. maculata*. These are partly differentiated with *P. berkeleyae* possessing "dense" dorsal papillae and *P. maculata* with papillae limited to prostomium, parapodia, and palps and "mostly lacking" from the rest of the body. This history represents an example of taxonomic drift from the original description to the most current publication. Use of subjective terms such as "sparse", "finely", "more numerous", and "densely" may be clear to an author but are easily misinterpreted by subsequent workers. Hartman's original description and illustration of *P. maculata* showed no papillae on the dorsum. Varying degrees of dorsal papillation do not fit Hartman's description and illustration for *P. maculata*, but do fit conditions of *P. berkeleyae*. Local specimens without papillae on the dorsum best fit the concept provided by Hartman in 1947. All others are more likely within the concept of *P. berkelyae*.

We finished the meeting by discussing and examining type and other material of several *Sigambra* species. We began with *Sigambra setosa*. There seems to be some confusion over the length of the median antenna in the literature. Fauchald's (1972) original description states, "the median antenna is slightly longer than the lateral ones". The figure on pg. 435 of Fauchald (1972) shows the median antenna as being equal in length to the lateral antennae. Blake (1994) illustrates *S. setosa* on p. 289 with a much longer median antenna and describes it as extending twice the length of the prostomium. On page 290 Blake comments on this difference. In her examination of Fauchald's original material (including the type), Leslie found that the median antenna varied from being subequal in length to 1/3 longer than the lateral antennae. Blake based his species determination on the presence of extra notosetae, which he considered more important taxonomically than the length of the median antenna. Unfortunately, this character is hard to see, and extra notosetae do occur in *S. tentaculata* as well (LH, pers. obs.). Leslie feels that the length of the dorsal cirrus on setiger 1 and the number of distal papillae on the rim of the proboscis are easier characters for separating *S. setosa* and *S. tentaculata*, which both have notopodial hooks beginning on setiger 3-4 (dorsal cirri of setiger 1 are 4-5 times as long as ventral cirri and 8 distal papillae in *S. setosa,* dorsal cirri of setiger 1 twice as long as ventral cirri and 14-16 papillae in *S. tentaculata*). Re-examination of the holotype of *S. setosa* at the meeting reaffirmed that the median antenna is one and one-third longer than the laterals, and also showed that the capillary neurosetae are extremely long, giving the specimen a very distinctive shaggy appearance.

As a continuation of last month's polychaete meeting a very useful lumbrinerid worksheet done by Ricardo Martinez-Lara (CSDMWWD) has been included with this newsletter. It includes diagnostic characteristics of the most common lumbrinerids reported in southern California. Ricardo has also left room in the table for members to add their own observations with the hope that we will, eventually, be able to better define our local lumbrinerid species.

SO... DO YOU HAVE *Sosanopsis*?

By Tom Parker (CSDLAC)

The SCAMIT Taxonomic List contains the name *Sosane occidentalis* and *Sosanopsis sp.* A number of benthic programs involved in creating the SCAMIT List have reported *Sosane occidentalis*. Few have reported specimens of *Sosanopsis*. Fauchald's 1977 monograph erroneously defined *Sosanopsis* as having its modified notopodia on the last thoracic (15th) setiger. Banse (1979) corrected this error and noted both *Sosane* and *Sosanopsis* have a modified 13th thoracic setiger. Ampharetids with modified and elevated notopodia at thoracic setiger 13 (unciniger 10) are correctly placed in

one of these two genera. They are separated based upon presence or absence of palea and whether the branchia are arranged in a transverse pattern or with the fourth outer pair one segment posterior to the other three pair. Please inspect your local specimens reported as *Sosane occidentalis*. If they are without palea they belong to *Sosanopsis*. If you have specimens of either *Sosane* or *Sosanopsis* please pull them for a future SCAMIT meeting where we can, hopefully, resolve this problem and issue a SCAMIT voucher sheet.

i i, CAPTAIN KELLETT

As taxonomists we are forced to deal with trivial questions of nomenclatural correctness all too often. This is the legacy of misunderstanding and carelessness left us by previous workers. We too are sometimes guilty of originating or perpetuating such errors, so we must just grin and bear it. In this age of electronic databases differences in spelling have become much less trivial. Non-identical spellings which a human would have immediately recognized as representing the same animal will be treated as two different animals by a computer program.

While proofing Edition 2 of the SCAMIT Species List (for the umpteenth time) I finally noticed an overlooked discrepancy in spelling the name of Kellett's Whelk. This is *Kelletia kelleti* in the AFS mollusk list (Turgeon *et al* 1988), and *Kelletia kelletti* on the SCAMIT ED2 list. Seeking a tie breaking opinion I consulted McLean (1969) and found *Kelletia kelletii*. By now thoroughly confused I consulted a variety of other references and found they disagreed on the correct spelling of both the generic and specific names of this animal. Keen and Coan (1974) were in agreement with McLean. The species was not included in (Keen 1971), but interestingly there were two other taxa whose names were patronymics based on the same person; *Chione kellettii* and *Macron kellettii*. This has no direct bearing on the correct spelling of the whelk's name, but does point to the fact that the name of the person honored by all these names was Kellett, not Kellet.

Captain Henry Kellett, R.N., commanded the British vessel H. M. S. Herald on several voyages to the eastern Pacific in the 1840s and 1850s retrieving shells from as far north as Alaska, and as far south as central Mexico, with stops in Canada, Washington, Oregon, California, and Hawaii. His collections were returned to England, where Forbes, Arthur Adams and others examined them, describing new taxa of both marine and land mollusks.

I next reached for Abbott (1974), finding the same orthography as on the AFS list. Josiah Keep used *Kellettia kellettii* in his West Coast Shells (1935), yet another variation. Grant and Gale (1931) used the same spelling as McLean. In their synonymy they showed the spelling *kellettii* already in use by Carpenter in 1864, and cited Forbes' description of the species as *Fusus kelletii*. Oldroyd (1927), in contrast, indicated the species as described by Forbes to be *Fusus kellettii*, and listed the species as *Kellettia kellettii*, the same combination later used by Keep. Thiele (1931) listed *Kelletia* as a subgenus of *Siphonalia*, giving the type as *S. (K.) kellettii*. It was clear that, regardless of which option was correct, it was unlikely to be the one on the SCAMIT list.

Neither consensus nor predominance of use defines correct usage under the Code (Ride 1985), so we must examine the Code provisions. As to the spelling of the specific name the Code is explicit. The original spelling is to be preserved unaltered unless it is demonstrably incorrect under Section 32c, or unless a mandatory change in ending is required by Article 34. Section 32c requires clear evidence in the original publication that an inadvertent error has taken place. This would have no bearing on whether an *i* or *ii* ending was correct, but might affect whether or not two t's were correct. If the species was indicated as dedicated to Kellett in the text, then an original spelling of the name as *kelleti* (or *ii*) might be interpretable as an inadvertent error subject to correction. Either the *i* or *ii* endings could be correct for such a genitive noun, depending on which was actually used by Forbes. If both occur in the original publication, then the first reviser determines the correct use (Article 32b).

The case of the generic name is also confused, but requires a separate resolution independent of the specific name. Apparently the name was either erected by or attributed to Bayle in Fischer, constructed either as *Kelletia* or *Kellettia*, depending on the secondary source consulted. Neave (1939) lists this as *Kelletia* (Bayle MS) Fischer 1884. Once again it is necessary to return to the original publication to determine which usage is correct. Both of the necessary original publications were consulted in the NHMLAC Research Library on 11 March 1996.

In the original description (Forbes 1852b) the species is listed as "*Fusus Kelletii*, sp. nov." on page 274, so the proper ending for the specific epithet is *ii*. There is, however, an indication in the original article that Forbes was indeed establishing his new species for Captain Kellett, and that an inadvertent error in spelling may have taken place. The article itself bears Kellett's name, correctly spelled, in it's title. Forbes gave the etymology of his new species thusly "I have dedicated this unique shell to the eminent conductor of this important expedition." Since the spelling of the specific name is identical in the text and on Plate IX the "clear" indication required by the code is only debatably present.

Other inconsistency in use of *Kelletii* and *Kellettii* occurrs elsewhere in this volume of the Proceedings of the Zoological Society, and in Part XXI 1854 [for 1853]. The article in which Forbes described *Fusus kelletii* was part two of a series; part one preceded it in the same volume and dealt with terrestrial mollusks (Forbes 1852a). In the text of this earlier part Forbes states "In the assemblage of mollusks collected by Capt. Kellett and Lieut. Wood,..." again demonstrating he was aware of the correct spelling of Kellett's name. On the same page (page 53) he states in his introductory discussion "*Helix Kellettii* and *Pandorae*, both new, are probably from the same country,...". In the actual description on page 55 he again has *Helix Kellettii*, but does not provide etymology. This species occurred on the same plate as *Fusus Kelletii*, and is indicated on the caption for that plate as being *H.*[*elix*] *Kelletii*. On the following plate (Plate X) we also find a new species attributed to A. Adams and captioned as *P.*[*seudoliva*] *Kelletii*. The description of this species was delayed, not appearing until Part XXI in 1854. On page 185 of that article Adams describes this taxon [now *Macron kellettii*] as *Pseudoliva Kellettii*, but does not provide explicit etymology (Adams 1854).

The demonstrated knowledge of the correct spelling of Captain Kellett's name in Forbes' articles, and differences in spelling of that name in text and associated plates of both the Adams article and Forbes' on terrestrial mollusks suggest the authors, the typesetters, or the printers were careless. As the same problem occurs in two papers by different authors I suspect the problem was in journal production. There is material here for an application to the International Commission for a correction of an inadvertent error, but not enough [in my view] to satisfy the "clear evidence" criterion of the Code.

The generic name *Kelletia* was erected without comment as a subgenus of *Siphonalia* by Fischer in 1884 based on an unpublished manuscript by Bayle (Fischer 1880-87). He listed no etymology at that time, but cited *kelletii* Forbes as the only species in the subgenus. It seems clear that Fischer's name was based on Forbes' species name, and was not directly intended as a patronym for Captain Kellett. His action seems entirely correct, and his use of the single "t" cannot be interpreted as an inadvertent error in spelling. In the event of an application to the International Commission for determination that Forbes' *Kelletii* was an inadvertent error subject to correction, Fischer's name should also be changed in the interests of nomenclatural stability. The tension and uncertainty engendered by alternative spellings of the same name in the generic and specific epithets would continue to sow confusion in the ranks of future taxonomists, and should be removed by Commission action in the interests of stability.

Thus currently, pending an application to and subsequent action by the International Commission on Zoological Nomenclature, the correct spelling of the name of Kelletts Whelk should be *Kelletia kelletii*. - Don Cadien

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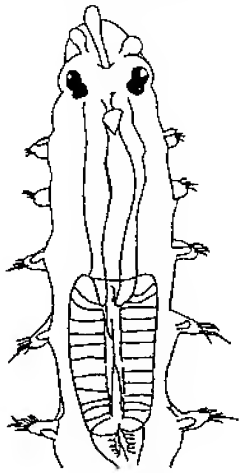
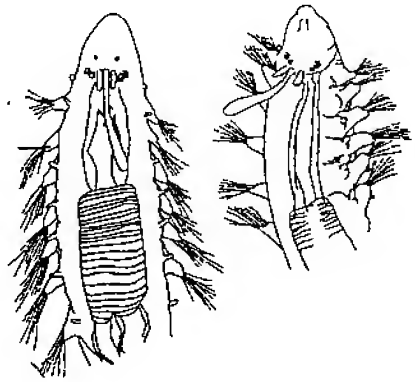


Exogone (Exogone) dwisula
from Kudenov and Harris 1995



Exogone (Parexogone) acutipalpa
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Within-Species Variation in Caridean Shrimp

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Readers trying to use the keys to local shrimp have complained recently about finding numerous "exceptions to the rule"--specimens with too many or too few teeth, a rostrum that is short, broad, elevated or missing entirely, fingers that gape, etc. Do these specimens belong to undescribed species, or are they variants of known ones? To help the reader distinguish between what is "normal" variation and what is "significant", the following list is provided.

Number of spines or teeth of rostrum, telson, dorsal surface of carapace, segments of pereopods: Varies in families Hippolytidae, Alpheidae, Pandalidae, Palaemonidae

Shape and elevation (angle) of rostrum: Sexually dimorphic in Hippolytidae and Pandalidae, quite variable in Crangonidae. Entire rostrum may be absent in Alpheidae.

Length and breadth of third maxillipeds: Sexually dimorphic in Hippolytidae.

Shape of chela and gape of fingers: Sexually dimorphic in Alpheidae and Palaemonidae (also in many other decapods).

Number of articles in subdivided appendages: Variable in family Processidae and hippolytid genus Lysmata (and related tropical genera). Occasional variability in Synalpheus.

Spines of antennal bases and chelipeds: Often are lost or blunt in very large adult Alpheidae.

Amount of setae on carapace and abdomen: Variable in Hippolytidae. Species of Lebbeus can be unusually "furry" in appearance. Note that pile or setae often wears off in preserved specimens, especially in the Crangonidae.

Width of body (carapace and abdomen): Female may indeed be a "broad" in the Crangonidae and Hippolytidae, also in palaemonid genus Pontonia.. (Bad pun...)

Epipods of pereopods: May be absent or not bilaterally symmetrical in Hippolytidae.

Living color: Highly variable according to food source in most families, although there may be a range of variation in species-specific spots, patches or other marks.

First and second pleopods: Male carideans typically have an appendix masculina on the second pleopod; however, pandalids and some deep-sea pelagic carideans also have broad flaps on the male's first pleopods. Species of Lysmata and Pandalus typically are protandrous hermaphrodites, so expect to find "intersexes" among them.

Few people have noted knobs or spines on the abdominal sterna (ventral regions), but these do occur in many carideans, and may be diagnostic of age, sex or even species. Also there are few reports on the morphology of the inner mouthparts (mandibles to second maxillipeds), but these also may have some variation. In one caridean family, the Bresiliidae, the mandibles are known to be asymmetrical.

A KEY TO THE SPECIES OF APHRODITA (POLYCHAETA) FROM THE WEST COAST OF NORTH AMERICA

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1. Dorsal notosetae (Fig. 4, noS(2)) with scales (Fig. 6); lateral notosetae include (Fig. 4, noS(1)) capillaries and stout spines . . . . . A. falcifera Hartman, 1939

1. Notosetae without scales; lateral notosetae entirely capillary 2

2. Thickest dorsal notosetae 2X thicker than thickest neurosetae 3

2. Thickest dorsal notosetae as thick as or thinner than thickest neurosetae 4

3. Dorsal notosetae with large asperities (Fig. 7); median antenna clavate (Fig. 1); lower rows of neurosetae often with spurs (Fig. 9) . . . . . A. armifera Moore, 1910

3. Dorsal notosetae without large asperities; median antenna cirriform (Fig. 2); lateral notosetae iridescent golden-green . . . . . A. sp. A

4. Lateral notosetae shaggy, white, conceal neurosetae; median antenna reduced to a small tubercle (Fig. 3) . . . . . A. sonorae Kudenov, 1975 (includes A. mexicana Kudenov, 1975)

4. Lateral notosetae iridescent green, free of debris; neurosetae concealed; median antenna cirriform; neurosetae with tips produced to points . . . . . A. refulgida Moore, 1910

4. Lateral notosetae colorless, often encrusted with debris; neurosetae often project beyond lateral setae 5

5. Median antenna clavate 6

5. Median antenna cirriform 8

6. Eyes large, confluent (Fig. 1); thickest neurosetae 1.8X thicker than thickest dorsal notosetae . . . . . A. brevitentaculata Essenberg, 1917

6. Eyes small; thickest neurosetae and notosetae about equal . . 7

7. Dorsal notosetae acutely constricted proximal to hooked tips (Fig. 8); lateral fascicle of dorsal notosetae number 12-20 . . . . . A. castanea Moore, 1910

7. Dorsal notosetae hooked but not acutely constricted (Fig. 5); notosetae number 10 . . . . . A. negligens Moore, 1905

8. Body less than 10 mm; 27 segments; middle and lower rows of neurosetae with spurs (Fig. 10). . . . . A. parva Moore, 1905

8. Body usually larger with more than 30 segments; small individuals may have some lower neurosetae with spurs 9

9. Eyes present; median parapodial length to body width (exclusive of parapodia) ratio about four to one . . . . . A. japonica Marenzeller, 1879

9. Eyes absent; parapodium to body width ratio about two to one . . . . . A. longipalpa Essenberg, 1917

Figure 1 from Essenberg, 1917; Figures 2 and 4 from Pettibone, 1963; Figure 3 from Kudenov, 1975; Figures 5 and 10 from Moore, 1905; Figures 8, 9 and 11 from Moore, 1910; Figures 12 and 13 from Hartman, 1939.

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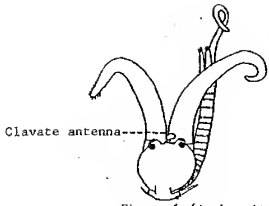


Figure 1 (A. brevitentaculata)

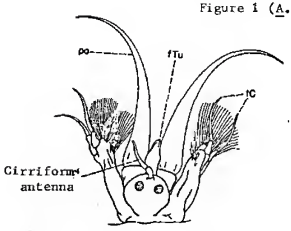


Figure 2

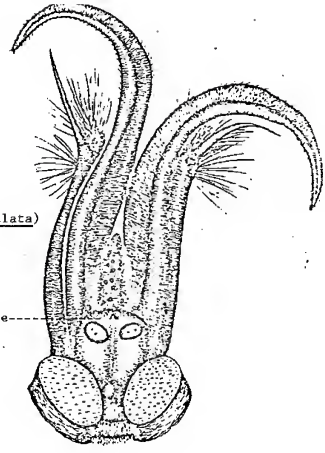


Figure 3 (A. sonorae)

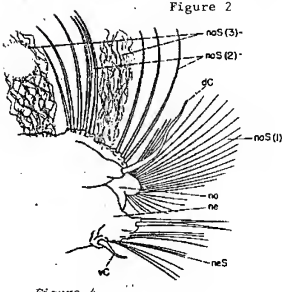


Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Figure 10

Figure 11

Figure 12

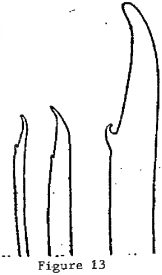


Figure 13

Lumbrineridae worksheet

Feb 96/RML

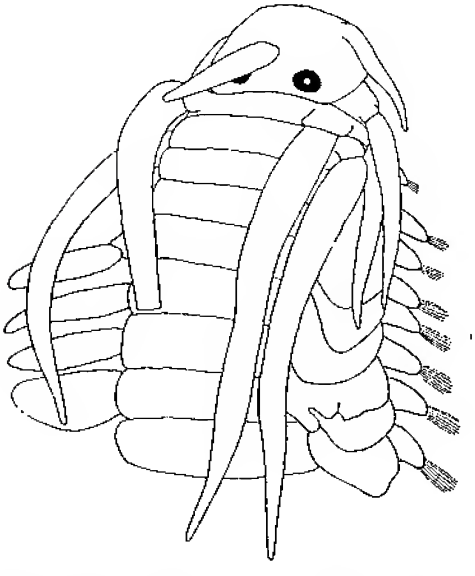
Notes:
LL: L. Lovell, 1996
LH: Leslie Harris
F: Fauchald, 1970
H: Hilbig, 1995
Y: indicates your observation

Lobe length comparison (dorsal view):
+ = lobe prolonged relative to anterior condition
- = lobe not prolonged relative to anterior condition

	Acicula color (Dark=darker than setae)	Hooded hooks Begin	ANTERIOR	MID-BODY	POSTERIOR	Hooded hook blade length/width ratio	Maxillary condition	Group
Lumbrineris cruzensis Hartman 1944	yellow	composite setiger 1	PRESETAL / POSTSETAL		PRESETAL / LL / POSTSETAL + / +	H: 2:1 @ set 10 Y:	H: I-1,II-4,III-1,IV-1,V-? Y:	I
L. limicola Hartman 1944	yellow	composite setiger 1			LL - / +	H: 3:1 Y:	H: I-1,II-4,III-1,IV-1,V-? Y:	
L. latreilli Audouin & Milne Edwards 1834	yellow	composite setiger 1			LL - / -	H: 4:1 @ set 10 Y:	H: I-1,II-4(6),III-2,IV-1,V-? Y:	
L. californiensis Hartman 1944	dark	composite setiger 1			LL + / +	H: 4:1 @ set 7 Y:	H: I-1,II-3(4),III-1,IV-1,V-P Y:	II
L. index Moore 1911	dark	composite setiger 1			LL - / +	H: 5:1 @ anterior Y:	H: I-1,II-4,III-2,IV-1,V-? Y:	
L. japonica (Marenzeller 1879)	dark	composite setiger 1	LL		LL - / -	H: 2:1 @ set 1 Y:	H: I-1,II-4(6),III-2(1),IV-1,V-? Y:	
Eranno lagunae (Fauchald 1970)	yellow	simple setiger 1			+ / +	H: 6:1 @ anterior Y:	H:I-1,II-4(6),III-1,IV-1,V-P Y:	III
Lumbrineridae sp C L. Harris	yellow	simple setiger 1			+ / +			
Scoletoma tetraura (Schmarda, 1861)	yellow	simple setiger 1			- / +	H: 7:1 @ anterior Y:	H: I-1,II-4(5),III-2,IV-1,V-P Y:	
Lumbrineridae sp B L. Harris	yellow	simple setiger 6-8			+ / +		LH: I-1,II-4,III-1,IV-1,V-?	
Lumbrinerides platypygos (Fauchald 1970)	yellow	simple setiger 7-10			- / +		F: I-1*,II-3,III-1,IV-1 *Plus two basal dentitions	
Lumbrineridae sp A L. Harris	yellow	simple setiger 6-7			? / +			
Eranno bicirrata (Treadwell, 1929)	dark	simple (bidentate) setiger 7-9			+ / +	H: 6:1 @ set 15 Y:	H: I-1,II-4(7),III-1,IV-1,V-P Y:	IV

April, 1996 SCAMIT Newsletter Vol. 14, No.12

NEXT MEETING:	*Eumida* and related genera
GUEST SPEAKER:	Danny Eibye-Jacobsen
DATE:	May 13 -14, 1996
TIME:	9:30am - 3:30pm
LOCATION:	Worm Lab, Natural History Museum of Los Angeles County 900 Exposition Blvd., Los Angeles, CA



Eumida longicornuta (from Eibye-Jacobsen 1991)

MAY 13 - 14 MEETING

The May meeting will be held over two days at the Worm Lab of the Natural History Museum and hosted by Dr. Danny Eibye-Jacobsen from the Zoological Museum, University of Copenhagen. The meeting will be a discussion of phyllodocid polychaetes, especially *Eumida* species. Members should bring any problem specimens for examination by Danny along with any questions on this group of polychaetes.

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ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.
SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

MEETINGS, MEETINGS, MEETINGS

There are several important meetings that may be of interest to members that will be occurring in the next few months.

May 3 - 4 So. Calif. Academy of Sciences at Loyola Marymount University. One of the Friday symposia is on regional marine monitoring in the southern California Bight.

June 23 - 27 Western Society of Malacologists in San Diego at the Handlery Hotel and Country Club. Refer to March newsletter Vol.14(11) for details.

July 14 -18 The Crustacean Society Meeting and the 3rd International Large Branchiopod Symposium (held jointly) at the University of San Diego. Refer to Feb. newsletter Vol.14(10) for details.

August 5-9 9th International Echinoderm Conference, San Francisco. Seven Hills Conference Center, San Francisco State University. Contact Rich Mooi at the California Academy of Sciences @ (415) 750-7086 or rmooi@cas.calacademy.org for further information.

"SCAM IT" NEWSLETTER

The April 1st edition, Volume 14(13) seems to have been well received by the membership. Those of you who let your newsletter pile up before reading it or don't read it all the way thru missed out on a good chuckle last month. The newsletter staff is planning another edition for next year and will certainly welcome articles from other "twits" and "fools". Please submit articles as soon as Thalia (the Muse of Comedy - for the classically impaired) smites you with the whoopie cushion of inspiration. All submissions are welcome, but, with a year to prepare, we will attempt more subtlety in Volume 15(13).

ANOTHER INTRODUCED SPECIES

At the April meeting John Ljubenkov (MEC) informed members of an introduced species of anemone that has large stinging cells on its tentacles and lives on eelgrass. This anemone has been recently reported in Mission Bay by scientific divers. It is an apparently undescribed species in the genus *Bunodeopsis* which also has been taken in the Gulf of California according to John.

The City of San Diego has also recently seen another species of heart urchin *Nacospatangus depressus* in their trawls, which was previously unreported in local monitoring samples. This species was listed and illustrated in Charwat and Word 1975 as *Gonimaretia laevis*. They indicated it had been taken at 18m depths off San Clemente Island. It is more oval in shape than *Lovenia cordiformis*, but generally resembles that species although it lacks both long dorsal spines and an anterior ambulacrum. It is actually more closely related to *Spatangus californicus* and is in the family Spatangidae, not the Loveniidae. Both *Nacospatangus* and *Lovenia* were noted as occurring in the same trawl off Pt. Loma, so we should all critically examine our "Lovenia" to be sure they don't hide a few *Nacospatangus* as well.

According to Maluf (1988), the synonymy of *Gonimaretia laevis* with *Nacospatangus depressus* is provisional, and may be reversed once a definitive study of these animals is done. She lists it as having a depth range of 5-302m. The record from San Clemente Island represents the recorded northern range limit for the species, which ranges south to Isla Espiritu Santu.

BUBBLE SHELL NAMES

In Edition 2 of the SCAMIT Taxonomic Listing bubbleshells of the genus *Haminaea* were indicated as being in the family Atyidae. This placement is no longer accurate. For some time

a problem in nomenclature at the family level has been noticed by some workers. Dr. Myra Keen, in a letter to Jim McLean in the early 70's pointed out the problem, and suggested that the solution rested with the ICZN.

The problem was one of homonymy at the family level. In Mollusca there is a family Atyidae based on the type genus *Atys* de Montfort 1810. In Crustacea there is a family Atyidae based on the type genus *Atya* Leach, 1816. This later taxon was a replacement name for *Atys* Leach, 1815 [in Crustacea] non *Atys* de Montfort 1810 [in Mollusca]. In either case the family name derived from the generic name is the same, Atyidae. The family name was introduced in Crustacea by De Haan 1849, while it did not find usage in Mollusca until Thiele 1926. The next available family name is Haminaidae Pilsbry 1895. This name has been variously spelled as Haminaidae, Haminoeidae, and Haminaeidae based on the transliteration of the diphthong ae. There is currently before the ICZN a proposed use of the plenary powers for conservation of the name *Haminaea* Leach 1820, and for fixation of the correct spelling of the family name as Haminaeidae (Giannuzzi-Savelli & Gentry 1990). While the commission has not as yet formally acted, the evidence that the proposed approach is the correct one is persuasive (at least to your editor). Accordingly, the next edition of the Taxonomic Listing will replace the family Atyidae in mollusks with the family Haminaeidae [the generic change from *Haminoea* to *Haminaea* has already been made]. - Don Cadien

NEW LITERATURE

Volume 9 of the MMS Taxonomic Atlas, The Mollusca, Part 2, Gastropoda with sections by Jim McLean and Terry Gosliner is published and subscribers should be receiving it soon.

A Listing of Living Mollusca by Yoshihiro Goto and Guido T. Poppe has been recently published. It is in two parts and four volumes and includes 41,861 species. Its cost is $US 185 plus postage for all four volumes. The weight of all 4 volumes together is almost 10 kg. Orders for this set may be sent to:

Mostra Mondiale Malacologia
Via Adriatica Nord, 240
63012 Cupra Marittima (AP - Italy)
tel: 39 (0) 735 777550
fax: 39 (0) 735 777232

Also, recently published by Y. Goto and P. Anseeuw is *The Living Pleurotomariidae*. This is a comprehensive synopsis of recent Pleurotomariidae which includes 24 species and 2 subspecies. It not only includes many text illustrations, color plates and distribution maps, but SEM images of radula as well. It costs $US 210 and it is hardbound with a cloth cover and slipcase.

It may be ordered from:

Naturama
C.P. 28 - Succ.26
90146 Palermo Italy
e-mail: naturama@mbox.vol.it
fax:+(91) 6713568

Payment should be made with your order by international postal money order or with a VISA card (for a 5% charge) by fax not e-mail for obvious reasons.

Also from the same publisher. *Seashells of Eastern Arabia* by D. Bosch, P. Dance, R. Moolenbeek and G. Oliver. It is hardbound and includes more than 1000 species from Oman and the Arabian Gulf illustrated with color plates and SEM images. It costs $US 80.

Shell-bearing Gastropods of the Arctic by A.N. Golikov is also available from Naturama. Its a softbound monograph with black and white plates only. It costs $US 45.

The latest number of the Proceedings of the Biological Society of Washington contains a paper by member Dr. Mary Wicksten on the taxonomy of local *Neocrangon* species. It reports the results of her reexamination of the validity of *Neocrangon zacae*, and concludes it is a synonym of *N. resima*. This is another in the series of papers on shrimp and other decapods in preparation for the upcoming large scale revision of the decapods of California. Mary has recently indicated that the first installment of this is already accepted and in press at the California Academy of Sciences.

In the same issue the thalassinid genus *Calocarides* is reviewed (Kensley 1996), and our local *Acanthaxius spinulicaudus* transferred into it in the process. This is now properly known as *Calocarides spinulicauda* (Rathbun 1902).

MINUTES OF APRIL 22 MEETING

The meeting began with the guest speakers Don Cadien (CSDLAC) and John Ljubenkov (MEC) giving members some background information on the taxonomy, biology, and anatomy of cephalaspid mollusks. This general information was distributed thru handouts, which have been included in this newsletter.

Most cephalaspid mollusks are predatory animals. They have radula and gizzard plates that they use to catch, consume and process their prey. Species of the genus *Bulla* are mostly vegetarian, while most other cephalaspid groups are carnivorous. Generally, cephalaspids live on the bottom of the ocean and burrow into the sediments. Most have glands that secrete a mucous sheet on or within which they crawl, so that the fine particulate matter of the sediment does not clog up their respiratory system.

The shape of the gizzard plates gives the taxonomist an idea of what the animals are eating. Species with large robust plates generally consume animals with strong shelly protection. Those with more gracile plates use them in crushing relatively fragile prey such as foraminifers, or use them only to hold the prey in position in the gut for gradual digestion.

Some have 3 equal or similar shaped plates while others have 2 equal or "paired" plates and 1 unequal or "unpaired" plate. The shape of the gizzard plates should allow the taxonomist to differentiate these animals to the generic level. While most of the gizzard plates of *Philine* are diamond shaped there seems to be some variation in the size and proportion among different species.

Before we broke for lunch Kelvin Barwick (CSDMWWD) showed members a videotape of cephalaspids from Pt. Loma. These included *Acteocina*, *Bullomorpha*, *Parvaplustrum*, *Volvulella*, *Philine sp. A* and *Philine californica*.

After lunch we examined specimens. First we examined *Philine auriformis*, the size of the animal making gizzard plate dissection a breeze. Megan Lilly (CSDMWWD) dissected the gizzard mass out with a ventral incision thru the foot using forceps and then cut the gizzard sheath with a small scalpel to separate the three plates. (Refer to the section on locating gizzard plates in the attached handouts.) We then compared these plates to *Philine sp. A,* which had 3 equal plates that were long and slender with a ventral rib that runs the entire length of the plates.

The *P. auriformis* plates were as illustrated by Gosliner (1995), flat laterally with a strengthening longitudinal rib, and prominently humped medially (the portion pointing into the lumen of the digestive tract) at midlength, although, not having a distinct rib. The lateral flat face was excavated near its center so the strengthening rib was almost free-standing near the middle of the plate.

We next compared shell specimens of *Cylichna diegensis*, *C. attonsa*, and *C. alba*. The specimens of *C. attonsa* came from Catalina Island, the Aleutian Islands, and Oregon. There

seemed to be quite a difference in opinion amongst members as to whether these shells were more straight sided or rounded at the shoulder and base. While we were unable to see much difference between the shells of *C. diegensis* and *C. attonsa*, the shell of *C. alba* was very different. It was thicker and had a closely adherent brown periostracum. The differences between *C. attonsa* and *C. diegensis* need to be further investigated by examination of the types.

We then looked at a very different cephalaspid shell, *Diniatys dentifera*, which had a small, but prominent tooth at the base of the columella. The specimens we examined were from Hawaii, but the species is also known from the eastern tropical Pacific. The small *Micraenigma oxystoma* Berry 1953 belongs in *Diniatys* (see Burn 1978) and Berry's species *oxystoma* may be a synonym of the nearly circumtropical *D. dentifera*. The holotype of *D. oxystoma* came from off the Coronados Islands just south of San Diego and, although not reported since, this species may occur in our samples.

The next specimens examined were *Acteocina inculta* from shallow water in outer Los Angeles Harbor. We dissected out the gizzard plates to see the two paired plates and the one unpaired, cordiform or heart-shaped plate, which is generally larger or equal in size to the paired plates. We also examined the suture of the whorls to see if these indeed belonged to *Acteocina* and not *Tornastra*, which is now distinguished by its deep groove or channel in the whorls (as well as by gizzard plate shape as in Marcus 1977). These specimens of *Acteocina* did not have a deep groove such as that expected in *Tornastra*. However, *Acteocina culcitella* does have this groove so it should be referred to *Tornastra culcitella*. Two other local species also appear to belong in *Tornastra*, *Acteocina infrequens*, and *Acteocina cerealis*.

We examined specimens from the mollusk collections of the Natural History Museum of Los Angeles County identified as all three of these species of *Tornastra*, but were only able to clearly separate *T. infrequens* on conchological grounds. This predominantly southern species was differentiated from the others by presence of three spiral color bands on the shell. These faint purple-black bands were separated by slightly less than their width, and stood out prominently against the white base color of the shell.

Bullomorpha sp A, which is listed in the SCAMIT Taxonomic Listing Ed2 as family uncertain, has been further examined anatomically in efforts to place it within one of the existing families. This effort was not successful. The radula of Bullomorpha sp A was examined and found to have the formula 6-7.1.0.1.6-7. The lateral tooth was about twice the size of the largest marginal tooth, and there was no central tooth. All teeth lacked denticles, and had a robust base and a long hooked cusp. Gizzard plates were lacking in the animal. The only family known to occur in the eastern Pacific which lacks gizzard plates and has a radular formula like that of the examined animal is the Gastropteridae. Bullomorpha is clearly not a gastropterid so we are must assume this animal requires a new family to contain it, and cannot be allocated to any of the existing families of cephalaspids.

Another change in local southern California cephalaspid taxonomy is *Meloscaphander sp. A* which will now be called *Parvaplustrum sp. B* due to successful removal, mounting and examination of the radula (FINALLY!!!) of both *Parvaplustrum sp. A* and *Meloscaphander sp A.* In both species the radula is very small relative to the size of the animal, and has a formula of 1.0.1 with numerous rows of flattened leaf-like teeth closely packed in series. The bases of these teeth were very small, as shown for the generotype of *Parvaplustrum* by Marcus and Marcus 1969. This radular configuration is very unusual, and differs from that of *Meloscaphander* (illustrated by Bouchet 1975 for *M. imperceptus*) which has differently shaped teeth, and a radular formula of 1.1.1. The two species are clearly congeneric based on their radulae, and appear properly placed in or near *Parvaplustrum*. In

both species gizzard plates are absent. Despite the similarity in shell to *Meloscaphander*, it's anatomy proves our species does not belong in that genus.

President Ron Velarde (CSDMWWD) brought three specimens of "Meloscaphander sp A" from a lot taken in about 500m from a submarine canyon off La Jolla. These were particularly fine and recently collected specimens with the typical glassy shell, but which showed pigmentation on the body corresponding to the pigmented liver area in *Parvaplustrum sp A*. This had not been seen in previous specimens, and may fade with longer storage. It did, however, make the two species (*Parvaplustrum sp A* and *sp B*) appear more similar.

The shells of the original lot of *Meloscaphander sp A* (taken at 630m off Orange County) were reexamined. They had lost their glassy transparency in the intervening decade, and were now translucent. Both John Ljubenkov (MEC) and Tony Phillips (Hyperion) recognized them as their "*Haminoea*" from deep-water, and may have additional records of the species in their data under that name. A new voucher sheet will be forthcoming providing description and illustration of the radula, and the key will be modified to reflect the pigmentation of the animal.

Lastly, we compared specimens of *Diaphana californica* and *D. brunnea*. In theory *D. brunnea* occurs in the boreal northeast Pacific, while *D. californica* is from the temperate and subtropical eastern Pacific. In examining specimens of *D. brunnea* from Alaska, no differences from *D. californica* could be seen in the shells. There may be consistent differences in the radula or gizzard plates of these animals, or other anatomical differences, but the shells appear to completely overlap in morphology. Gosliner (in the MMS Atlas) indicated that the separability of these two species should be reexamined, and we concur based on the specimens examined during the meeting. Specimens of *Diaphana minuta* examined from the Beaufort Sea during the meeting seemed to differ clearly from both *D. brunnea* and *D. californica* on the basis of the rotundity of the body whorl. Lemche (1948) illustrated such a range of shell shapes for *D. minuta* that the differences we saw in the one lot examined may not hold up with examination of other material.

ONE LESS TAXONOMIC MESS

A SCAMIT voucher sheet from Vol. 4 #2,3 (1985) reviewed the status of *Owenia collaris* and compared it to *Owenia fusiformis*. Collar development is a primary diagnostic character. Unfortunately, the presence or absence of the collar has been sometimes erroneously reported in the literature. This voucher sheet suggests that variability of this character needs to be reviewed to better resolve the species concept. The decision at that time was to continue use of the locally applied name, *O. collaris*. The SCAMIT Taxonomic List contains only *O. collaris* partly as the result of this early voucher sheet and assumptions about the validity of *O. fusiformis*. In 1994 J. Dauvin and E. Thiebaut reviewed the *Owenia* mess and published a resolution in the Proceedings of the 4th International Polychaete Conference. They conclude that *Owenia lobopygidiata* and *O. fusiformis* are the only two diagnosable species of *Owenia* and suggest that all records of *Owenia collaris* are *Owenia fusiformis*. They further conclude that *O. fusiformis* is one of a few true cosmopolitan species of polychaetes. A draft of a new SCAMIT voucher sheet is being produced and will be distributed for comments to all those interested.

-Tom Parker

BRANCHING OUT FOR NEW SPECIES... OR SPLITTING HAIRS OVER SPLIT ANTENNAE

Good diagnostic characters are hard to find. Consistent differentiation of one species from another requires good diagnostic characters. As pointed out by Dauvin and Thiebaut, cosmopolitan polychaetes have been widely

reported but difficult to confirm. They conclude that poor descriptions and lack of keys have led to confusion and give examples where several species are listed under a single name(e.g. the names *Terebellides stroemi* and *Spio filicornis* have both contained several different species). Doubtless many other examples can be thought of by newsletter readers. Paraonids are traditionally differentiated on fairly slight differences in delicate structures. Branchial shape and number, neurosetal tip structure (Strelzov illustrates at least 17 setal shapes/tips), and even setal curvature changes within a fascicle have all been used to define genera and/or species. Not surprisingly the interpretation of these features is sometimes uneven. This is fertile territory for new taxa names! The paraonid *Allia ramosa* has been widely reported in local benthic programs and can be differentiated from other paraonids based on its neurosetal structure and branched antennae. It is one of the few paraonids world-wide that have branched antennae. No other paraonid has been locally reported with branched antennae. This species name has been reported from such widespread areas as Puget Sound, Japan, Cape Blanco, and (originally) the Gulf of Peter the Great. Depths range from 10 meters to at least 2400 meters. Is such a wide ranging habitat confirmed by a stable morphological condition? Four published illustrations can be consulted regarding the branched antennae.

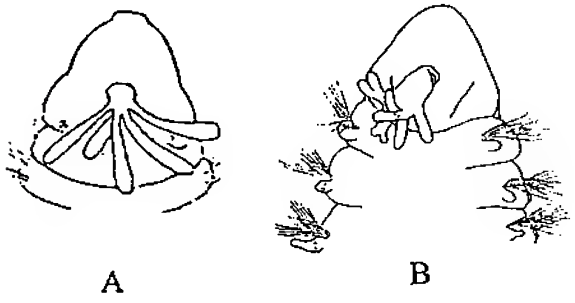
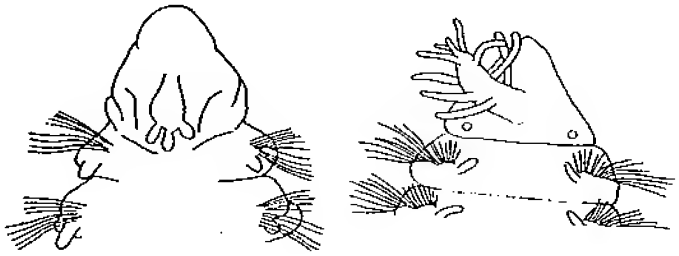


Figure 1 Antennae of *Allia ramosa* from A). Annenkova 1934; B). Strelzov 1973; C). Banse and Hobson 1968; and D). Hartman 1969.

Unfortunately, all four drawings show sharply different branched structures (Figure 1 A-D). Given the fine degree of structural discrimination relied upon in this family to define genera and species, the differences in these antennae are substantial enough to demonstrate a likely mix of species lumped under one name. None of the specimens reviewed from Palos Verdes resemble the original description depicted in illustration "A". They all are better matches for illustration "C".



Which antennae structure have you seen on your specimens? Have you ever seen the bifurcate branches illustrated in Strelzov? (Figure 1C). Has any re-examination of Hartman's specimen (Figure 1 D) been completed? If so, what species was it called. Bring some of your specimens or results of your re-examinations to the next SCAMIT polychaete meeting. We may have to just split the difference by issuing another provisional species voucher sheet for the local taxa.

-Tom Parker

Paraprionospio pinnata

In last month's newsletter there was mention of a table of diagnostic characters for *Paraprionospio* species, as described in the literature, prepared by Leslie Harris. We were unable to include this table with the newsletter due to an incompatible computer file format, but we now have it for this newsletter. Members should use this table to review and compare their own specimens of *Paraprionospio pinnata*. Perhaps this species is not cosmopolitan, as is commonly believed.

A RAPID TECHNIQUE FOR STAINING CIRRATULID POLYCHAETES

Local workers now use methyl green as the stain for species level identification of cirratulid polychaetes. Specimens of *Aphelochaeta* and *Monticellina* are abundant in many survey samples, with single benthic Van Veen grabs containing several hundred cirratulid specimens. These specimens require a great deal of time to handle and manipulate during staining, rinsing, destaining and identification. Problems with the current methods include slow stain uptake, long destaining process times, variable periods of staining and destaining, and messy liquid stain transfer procedures.

In Vol. 14, No. 6 of the SCAMIT Newsletter it was reported that formulation for methyl green stain varied between taxonomists, but that most people used 70% ETOH to dissolve the stain powder. The new modified technique reported here produces a much faster acting stain. The time necessary to process these specimens is greatly reduced. The new formula is:

3.0 grams methyl green powder
30 ml absolute ETOH
100 ml DI water
0.01gms KOH

This solution must be stirred to completely dissolve the powder.

New Staining materials:
Flat bottomed watch glass.
20-30 ml methyl green stain solution.
Gooch-style ceramic crucible (Coors 60151) with perforated bottom (5 cm tall).
Small disc of nitex screen cut to fit inside bottom of crucible.
Deep sided 300 ml pyrex dish for rinsing specimens in crucible.
70% ETOH for destaining.

New Staining Method

1. Set-up on stain resistant surface near sink with bulk 70% ETOH supply.
2. Pour or eyedropper stain solution into watch glass.
3. Place nitex screen in bottom of crucible.
4. With forceps, place a large number (50-100) of specimens inside crucible on top of nitex screen.
5. Immerse perforated bottom of crucible into solution in watch glass.
6. Allow solution to completely cover specimens, add drops of additional stain over specimens if necessary.
7. Wait approximately 1-2 minutes while specimens soak in stain.
8. Remove crucible and specimens to deep sided dish about half full of 70% ETOH.
9. Gently raise and lower crucible within this dish to rinse out the excess stain. Drain and replace with fresh ETOH until most of excess stain is gone.
10. Remove specimens from nitex screen with forceps and place in dish for examination with microscope. With a large number of specimens, an additional step of destaining may be necessary while in the watch glass.

Aphelochaeta marioni specimens will stain in less than two minutes and reveal their characteristic barring pattern after 2-3 brief rinses; while *Aphelochaeta sp. C* stains with it's general non-barred pattern. There does not appear to be any great change in the reported stain patterns with this formulation. Advantages of this new method:

- ☞Rapid stain uptake by specimens greatly reduces identification time.
- ☞Use of crucible to stain and destain assures uniform treatment to all specimens.
- ☞Rapid destaining of specimens in crucible.
- ☞Removes stain handling from the microscope area.
- ☞Produces same stain patterns reported in other technique.

Please send any comments you may have about
this technique to the newsletter editor.

-Tom Parker

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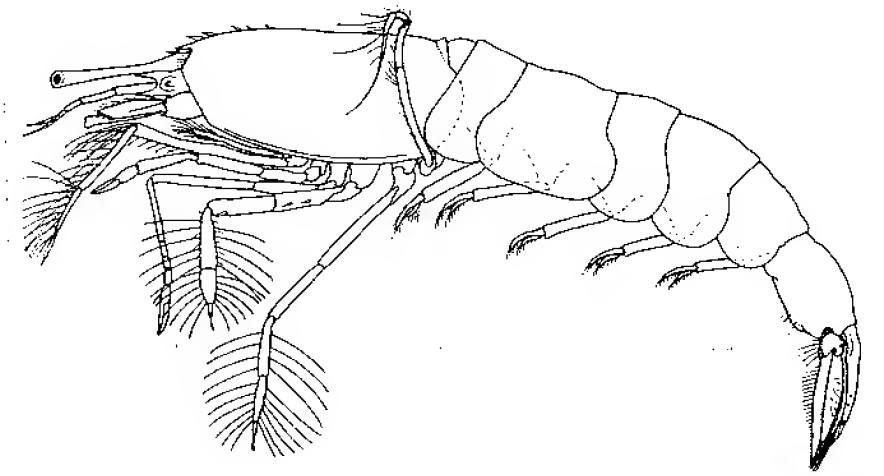

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SCAMIT TREASURY SUMMARY, 1995-96

During the past fiscal year, April 1995 though March 1996, expenses were twice as great as income reflecting SCAMIT's increased activity in producing newsletters and publications. Costs for producing the newsletter (including printing, postage, and supplies) increased from $2163.60 for last fiscal year to $3399.61 due to the increased content of the newsletter. The second edition of the Taxonomic Listing was published ($779.40) and SCAMIT Grant #96-1 was issued to Larry Lovell for a Nephytid publication ($584.34). SCAMIT's primary source of income, $1570.00, came from membership dues which covered half the costs for producing the newsletter. Grants and workshops will continue to be funded from the money collected for creating the Taxonomic Listing for SCCWRP during the 1994-95 fiscal year. The following is a summary of the expenses and income:

Expenses	
Newsletter	$3399.61
Publications (Taxonomic Listing, 2nd ed)	779.40
Grants	584.34
Miscellaneous	183.72
Total	**$5100.77**
Income	
Dues	$1570.00
Interest	385.76
T-Shirts	0.00
Donations	10.00
Miscellaneous	510.25
Total	**$2476.01**
Account balances (March 31, 1996)	
Checking	$ 999.49
Savings	17068.11
Total	**$18067.60**

REVIEW OF THE CEPHALASPIDS OF CALIFORNIA

Don Cadien (CSDLAC) and John Ljubenkov (MEC)

SCAMIT Meeting 22 APRIL 1996

Mollusks of the Order Cephalaspidea (s.l.) are well represented in the waters of the Northeast Pacific. They are frequently encountered in environmental sampling, and nearly always identified to at least generic level by local taxonomists. There are, however, many problems associated with the taxonomy of the group which should be further resolved. This is especially true at this time, when two separate treatments of the group which embody differing authoritative views are being introduced into the literature (the sections on Opisthobranch Mollusks by Gosliner and Gastropod Mollusks by McLean in the Taxonomic Atlas of the Santa Maria Basin and Western Santa Barbara Channel).

This group of opisthobranchs is transitional in that some are externally shelled, and some virtually lack shells. They have been treated both by workers who deal exclusively with shelled mollusks, and those who deal primarily with shell-less mollusks. Shelled mollusks have a fossil record, and many groups were established on the basis of fossils, or on the basis of the shell without reference to the animal which created it. This is a very different approach from that of the general run of opisthobranch workers who usually base their taxonomy on soft anatomy rather than hard parts of the animals they study. In both "camps" the radula is considered an important source of characters for differentiating species and/or higher taxa, but in groups which have been established based on fossils, radular evidence is lacking for the types. Nomenclatural schisms have developed, particularly over genera such as *Acteocina* and *Sulcoretusa* where the generotype is either a fossil or described on shell characters alone.

Characterization and Phylogeny of the group

Until fairly recently the cephalaspids were easily identified by the synapomorphy of possession of a cephalic shield. Recent cladistic analyses have drawn this into question by demonstrating that some groups with cephalic shields belong to other groups. Groups traditionally considered within the confines of the cephalaspids have been excluded on the basis of such cladistic reassessments.

There have been several cladistic analyses of the group, the most complete and recent being that of Mikkelsen 1996. She was very thorough in laying the groundwork for her analysis, testing and discarding many traditionally used characters as inappropriate to the purpose (Mikkelsen 1993). As in the analysis of Gosliner 1981, which was not based on a full application of cladistic methods, characters of the nervous, digestive, and reproductive systems were viewed as of importance in establishing the phylogeny of the group.

In Mikkelsen's analysis the family Acteonidae is removed from the Opisthobranchia, and combined with a few disparate groups at the base of the Heterobranchia. She terms this stem group "unresolved", but there is little doubt that it is very primitive. Other groups traditionally grouped with the Acteonidae in the Acteonoidea were retained in the Opisthobranchia, but outside the Cephalaspidea in the analysis. Representatives of the Hydatinidae and Ringiculidae were joined into another unresolved primitive group the "Architectibranchia"

With the Acteonoidea thus fragmented and dispersed, only three superfamilies remain in the Cephalaspidea; the Bulloidea, the Philinoidea, and the Runcinoidea (which was not included in Mikkelsen's analysis). The first two were united by four synapomorphies in the analysis: flexed ciliated strips in the mantle cavity, three gizzard plates, a secondarily prepharyngeal nerve ring, and

the genital ganglion on the visceral nerve loop (Mikkelsen, 1996). The earlier "synapomorphic" character of posession of a cephalic shield is, based on Mikkelsen's analysis, now not even particular to Opisthobranchia, and within the opisthobranchs is found both in cephalaspids and sacoglossans.

Taxonomy of the group

The taxonomy of the group above the species level is presented in the attached appendix; taxa represented in the northeast Pacific are indicated with asterisks. There are still a number of unresolved problems in the higher classification of the cephalaspids, and the taxonomy as presented here is of necessity subject to immediate or future modification based on new evidence. That presented is derived from traditional sources, and includes several groups now excluded from the cephalaspids on the basis of cladistic analyses.

Californian cephalaspid fauna

Although cephalaspids were treated comprehensively as part of several general mollusk monographs (ie. Pilsbry 1895-96, Oldroyd 1927) they were first specifically addressed for the northeast Pacific by Steinberg (1963). Her treatment is little more than a list of the described species organized into family and higher categories, but it provides a convenient summary of the taxa, and a matrix on which to build. The current list of the California cephalaspids (Table___) is smaller, with a number of species relegated to synonymy. There are also several undescribed taxa not included in Steinberg's list, some of which are familiar members of our soft-bottom fauna.

Biology of cephalaspids

Cephalaspids are predatory gastropods, living as hunters pursuing prey within the oxic surface layers of the bottom sediments. There are, of course, exceptions to this generalization. First among these are the bullids, which are herbivorous or omnivorous species (Rudman 1971b).

Regardless of diet, all members of the group are well adapted for movement on and through soft sediments. They bear a foot, generally broad, which is well supplied with mucous glands and has a ciliated surface for gliding locomotion. On soft sediments the mucous envelope secreted by the animal allows movement through sediments fine enough to clog respiratory surfaces, and fill the pallial cavity. This is prevented by secretion of a "sheath" within which the animal moves forward. This can be on the sediment surface, or below it. Much the same strategy and methods are used by other gastropod groups including the olivids, and the naticids.

The structure of the body also lends itself to rapid and effective burrowing in soft sediments. The shell is either reduced and internal, or external but covered by extensions of the mantle. This provides a smooth flexible surface over which the mucous envelope slides. Once again structure is homologous with the olivids and naticids, which also share the same life style.

Equipped by the above morphology cephalaspids can rapidly glide about in search of prey. Reported predatory strategy usually involves whole consumption of small prey items, but some members of the Acteonidae use a different strategy. These animals, including the local *Rictaxis punctocaelatus*, harvest exposed palps, cirri, or branchia of polychaete worms (Marcus 1972). This behavior, akin to siphon nipping by fishes, allows the prey to escape and regenerate the lost structures

TABLE 1

CALIFORNIAN CEPHALASPID MOLLUSKS

Superfamily Acteonacea	
Family Acteonidae	
Acteon traskii	Stearns 1898
Microglyphis brevicula	(Dall 1902)
Microglyphis estuarina	(Dall 1908)
Rictaxis painei	Dall 1903
Rictaxis punctocaelatus	(Carpenter 1864)
Family Hydatinidae	
Parvaplustrum sp A	[SCAMIT 1995]
Superfamily Diaphanacea	
Family Diaphanidae	
Diaphana californica	Dall 1919
Woodbridgea williamsi	Berry 1953
Superfamily Bullacea	
Family Bullidae	
Bulla gouldiana	Pilsbry 1895
Family Haminaeidae	
Atys castus	Carpenter 1864
Atys nonscriptus	(A. Adams 1850)
Diniatys oxystoma	(Berry 1953)
Micraenigma oxystoma	Berry 1953
Haminaea vesicula	Gould 1855
Haminaea virescens	(Sowerby 1833)
Haminoea olgae	Dall 1919
Family Retusidae	
Sulcoretusa montereyensis	(A. G. Smith & Gordon 1948)
Sulcoretusa xystrum	(Dall 1919)
Volvulella californica	Dall 1919
Volvulella catharia	Dall 1919
Volvulella cylindrica	(Carpenter 1864)
Volulella tenuissima	Willett 1944
Volvulella panamica	Dall 1919
Superfamily Runcinacea	
Family Runcinidae	
Runcina macfarlandi	Gosliner 1991
Runcinida sp A	[Cadien]
superfamily uncertain	
family uncertain	
Bullomorpha sp A	[Ljubenkov 1994]

Superfamily Philinacea	
Family Scaphandridae	
Acteocina harpa	(Dall 1871)
Acteocina oldroydi	Dall 1925
Acteocina inculta	(Gould 1855)
Acteocina carinata	(Carpenter 1857)
Acteocina intermedia	Willett 1928
Acteocina smirna	Dall 1919
Tornastra culcitella	(Gould 1853)
Tornastra rolleri	Ev. Marcus 1977
Tornastra cerealis	(Gould 1853)
Acteocina eximia	(Baird 1863)
Acteocina planata	Dall 1919
Tornastra infrequens	C. B. Adams 1852
Acteocina magdalenensis	(Dall 1919)
Meloscaphander sp A	[SCAMIT 1995]
Family Cylichnidae	
Cylichna attonsa	(Carpenter 1865)
Cylichna diegensis	(Dall 1919)
Family Aglajidae	
Aglaja ocelligera	(Bergh 1894)
Doridium adeliae	Dall 1894
Chelidonura phocae	Marcus 1961
Melanochlamys diomedea	(Bergh 1894)
Aglaja nana	Steinberg & Jones 1960
Aglaja sp A	[Cadien]
Navanax inermis	(J. G. Cooper 1863)
Doridium purpureum	Bergh 1893
Aglaja bakeri	MacFarland 1924
Family Philinidae	
Philine alba	Mattox 1958
Philine bakeri	Abbott 1974 (non Dall 1919)
Philine bakeri	Behrens 1993 (non Dall 1919)
Philine auriformis	Suter 1909
Philine bakeri	Dall 1919
Philine californica	Willett 1944
Philine polystrigma	(Dall 1908)
Broctonia polystrigma	Dall 1908
Woodbridgea polystrigma	(Dall 1908)
Philine cf quadrata	[MMS] (non Wood 1839)
Philine sp A	[SCAMIT 1988]
Philine "no radula/gizzard"	[Gosliner]
Philine "tubular"	[Gosliner]
Family Gastropteridae	
Gastropteron pacificum	Bergh 1894

- thus providing a renewable food source. Other acteonids apparently take the entire animal. Hurst (1965), for instance, records finding the polychaete *Owenia fusiformis* in the gut of *Acteon tornatilis*.

More typical predatory behavior is shown by *Tornastra culcitella* and *Cylichna attonsa*, which are selective feeders on benthic foraminifers (Shonman and Nybakken 1978). Similar feeding behavior is exhibited by *Retusa chrysoma* (Burn and Bell 1974) and *Relichna murdochi* (Rudman 1971a). Burn and Bell (op. cit.) report *R. chrysoma* also selectively consumes a small gastropod, *Salinator fragilis*. Consumption of small gastropods is also reported for the local *Acteocina harpa* (Beeman and Williams 1980).

Other members of the Philinoidea are their own worst enemies. Members of the Aglajidae are specialized opisthobranch predators, feeding on nudibranchs, other cephalaspids, and in many cases other individuals of their own species. The behavior of these hunters is best known through studies of our local *Navanax inermis* (Paine 1963, 1965). Hunting in these animals is strongly based on chemosensitivity to chemical cues left in the mucous trails of their opisthobranch prey. Once a trail is crossed by a *Navanax*, it is turned onto and followed to it's end, either in a meal or not, depending on which direction the predator adopts initially (to or away from the prey). If the prey is encountered it is attacked and swallowed whole by muscular contraction of the *Navanax* buccal bulb. No crushing or mastication of the prey occurs after swallowing, so that even very delicate shells of shelled prey are undamaged during passage through the *Navanax* digestive tract. Savvy shell collectors have long used this method of collection for the fragile shells of *Haminaea*, *Philine* and other cephalaspids. Not-so-savvy field collectors have found to their chagrin that a bucket full of opisthobranchs + one hungry *Navanax* = one contented *Navanax*, and nothing else.

Much more catholic tastes are exhibited by the introduced *Philine auriformis*. Food appears to be taken in proportion to availability in the environment, with food broadly defined. These hearty eaters have had guts filled with ophiuroid arm fragments, the crushed tests of the foraminifer *Rhabdamina*, other cephalaspids, *Pectinaria*, small *Parvilucina* and a variety of less identifiable fragments of benthic invertebrates. In their native New Zealand they are more specialized on strongly shelled small bivalves (Rudman 1970). Although predation by these animals has not been directly observed, it is assumed that capture is by snagging with the radula, followed by swallowing aided by the buccal pump. Once consumed the food is passed to the gizzard, where it is crushed by the action of the triad of robust gizzard plates and the muscular contractions of the gizzard. For those with sufficient interest in the subject, a wealth of information is available on feeding and digestion in cephalaspids (see for instance Rudman 1971a, b; 1972a, b, c, d).

All known members of the group are hermaphroditic, as are other opisthobranchs. Each animal contains both male and female reproductive organs, although these may not be simultaneously functional. Reproduction involves an exchange of sperm, internal fertilization, and deposition of fertilized eggs in an egg mass. Development is either direct, with larval stages passed within the egg and hatching as a metamorphosed juvenile; or indirect, with hatching of larvae from the egg. In the latter case the larval form may be short lived, metamorphosing rapidly into a benthic juvenile, or planktonic, with the larva (veliger) feeding for some period in the water column prior to metamorphosis.

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  - Family Acteonidae
    - * Acteon Montfort 1810
      - Tornatella Lamarck 1812
      - Speo Risso 1826
      - Kanilla Sowerby 1838
      - Myosota Gray 1847
      - Alexandria Tomlin 1926 non Pfeffer 1881
      - Tomlinula Strand 1932
    - Crenilabrum Cossmann 1869
      - Lissacteon Monterosato 1890
    - Inopinodon Bouchet 1975
    - Japonacteon Taki 1956
    - Mazacteon Rudman 1971
    - * Microglyphis Dall 1902
    - Mysoulfa Ev. Marcus 1974
    - Neactaeonina Thiele 1912
    - Ovulacteon Dall 1889
    - Pupa Roeding 1798
      - Solidula Fischer von Waldheim 1807
    - * Rictaxis Dall 1871
      - Acteonidea Gabb 1872
      - Pseudacteon Thiele 1925
  - Family Bullinidae
    - Bullina Férrusac 1822
      - Bullinula Swainson 1840
      - Perbullina Iredale 1929
  - Family Hydatinidae
    - Aplustrum Schumacher 1817
    - Hydatina Schumacher 1817
    - Micromelo Pilsbry 1894
  - Family undescribed
    - * Parvaplustrum Powell 1951
  - Family Ringiculidae
    - Ringicula Deshayes 1838
- Superfamily Philinoidea
  - Family Scaphandridae
    - * Acteocina Gray 1847
      - Tornatina A. Adams 1850
      - Didontoglossa Annandale 1924
      - Neacteocina Kuroda and Habe 1952
    - Cylichnina Dall 1908
    - Mamillocylichna
    - Meloscaphander Schepman 1913
    - Scaphander Montfort 1810
      - Bullaria Rafinesque 1815
      - Assula Schumacher 1817
    - * Tornastra Ev. Marcus 1977
  - Family Cylichnidae
    - * Cylichna Lovén 1846
      - Bullina Risso 1826 non Férussac 1822
      - Cylindrella Swainson 1840 non L. Pfeiffer 1840
      - Cyclina Gray 1857 non Deshayes 1850
      - Bullinella R. B. Newton 1891
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  - Family Aglajidae
    - * Aglaja Renier 1807
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      - Acera Cuvier 1810
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      - Navarchus Cooper 1863 non Filippi & Verany 1857
    - Odontoglaja Rudman 1978
    - Philinopsis Pease 1860
  - Family Philinidae
    - * Philine Ascanius 1772
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      - Bullaea Lamarck 1801
      - ?Woodbridgea Berry 1953
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    - Pseudophiline Habe 1976
    - Spiniphiline Gosliner 1988
- Superfamily Philinoidea (cont.)
  - Family Gastropteridae
    - Enotepteron Minichev 1967
    - * Gastropteron Meckel (in Kosse) 1813
      - Sarcopterus Rafinesque 1814
      - Gastroptera Blainville 1825
    - Sagaminopteron Tokioka & Baba 1964
- Superfamily Diaphanoidea
  - Family Diaphanidae
    - Colobocephalus M. Sars 1870
    - Colpodaspis M. Sars 1870
    - * Diaphana Brown 1837
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    - Newnesia Smith 1902
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    - Toledonia Dall 1902
      - Odostomiopsis Thiele 1903
      - Ohlinia Strebel 1905
      - Ptisanula N. Odhner 1914
  - Family Notodiaphanidae
    - Notodiaphana Thiele 1917
      - Diaphanella Thiele 1912 non Clessin 1880
- Superfamily Bulloidea
  - Family Bullidae
    - * Bulla Linnaeus 1758
      - Bullus Montfort 1810
      - Bullaria Rafinesque 1815
      - Bullea Blainville 1825
      - Vesica Swainson 1840
      - Quibulla Iredale 1929
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      - Utriculus T. Brown 1844 non Schumacher 1817
      - Coleophysis P. Fischer 1883
    - Relichna Rudman 1971
    - * Sulcoretusa J. Q. Burch 1945 [=Cylichnina Monterosato 1884 fide Abbott 1974]
    - * Volvulella Newton 1891
      - Volvula A. Adams 1862 non Gistel 1848
      - Rhizorus aucct. non Montfort 1810
- Superfamily Runcinoidea
  - Family Ildicidae
    - Ildica Bergh 1889
    - Lapinura Marcus & Marcus 1970
  - Family Runcinidae
    - Ilbia Burn 1963
    - Metaruncina Baba 1967
    - Pseudoilbia Miller & Rudman 1968
    - * Runcina Forbes 1851
      - Pelta Quatrefages 1844 non Beck 1837
      - Runnica Miller & Rudman 1968
    - Runcinella Odhner 1924
    - * Runcinida Burn 1963

ANATOMY OF NEW CEPHALASPIDEA

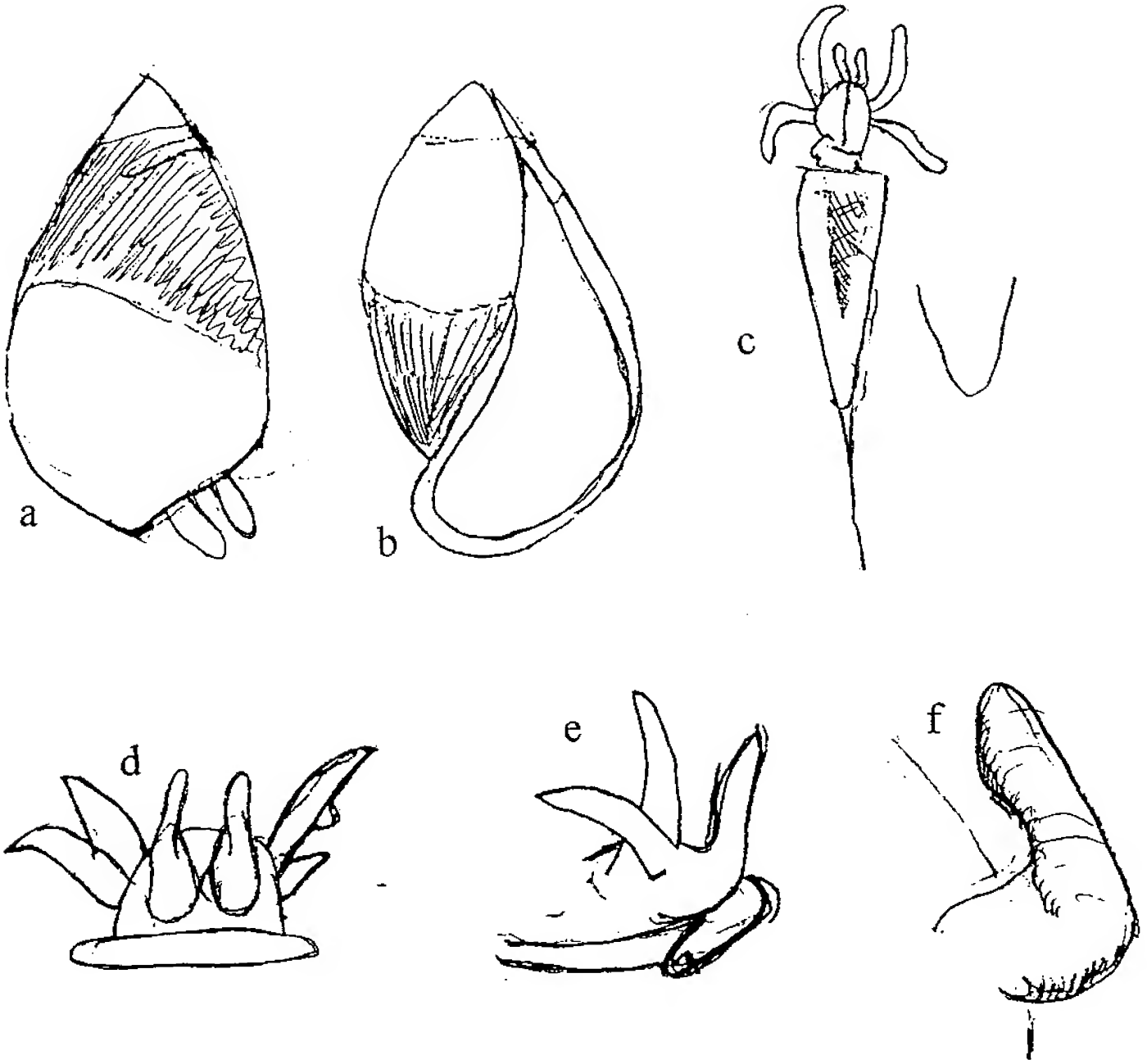
While most molluscan taxonomists ignore the soft bodies of their specimens, it is often the case that fleshy parts have many features which aid greatly in identification. These characters allow for the correct identication of damaged specimens with incomplete shells (often the case in screened material).

Paraplustrum sp. A

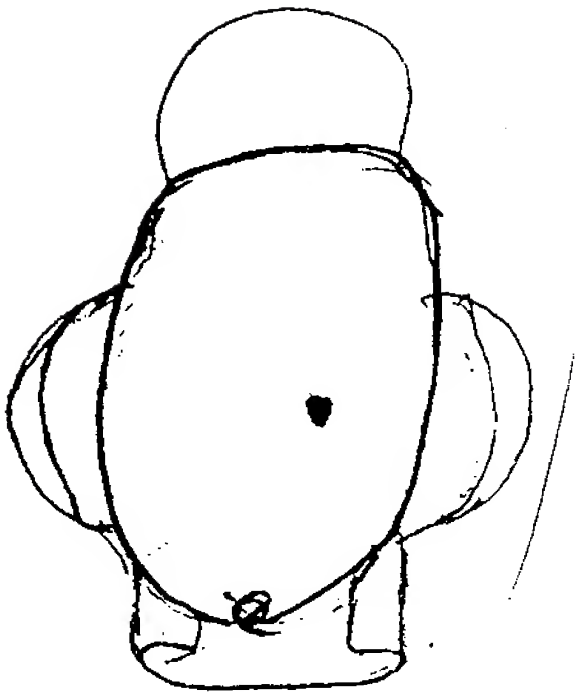
The **head** and its appendages are quite unique in comparison to other opisthobranchs. The center frontal portion of the head has a pair of **palps**(?) with swollen bases and digitiform distal ends. Posterolateral to each palp is a pair of **cephalic tentacles** whose bases are next to each other, and in one instance the bases were united.. The anterior foot margin is extended on both sides into **propodial lobes** (which may be hidden by contraction). I have been unable to find eyes, but it would not be surprizing if they possessed them.. The **metapodium** or posterior end of the foot is extended into a long thread-like structure, also often hidden through contraction, but its exact position in life is unknown.

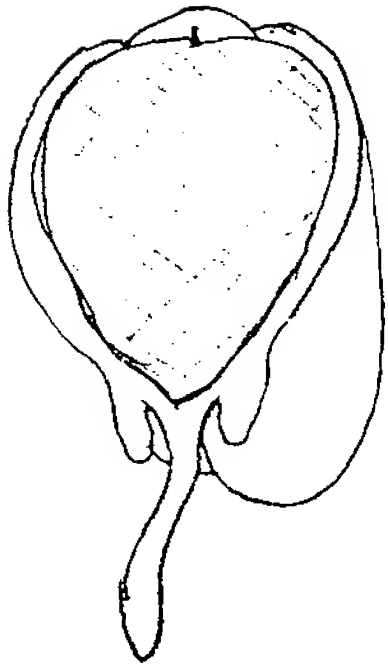
Bullomorpha sp. A

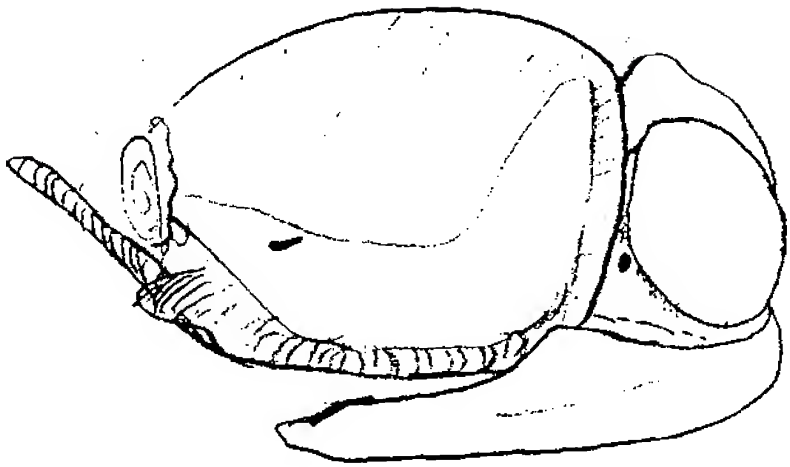
The **foot** is broadly cuneate and tapering posteriorly; it possesses two **parapodial lobes** which broadly flare out at the sides of the body. The **cephalic lobe** or disc is dorsally attached to the anterior end of the shell and usually protrudes even in contracted specimens. The **eyes** are positioned on the body just posterior to the base of the cephalic lobe and on either side of the mid-line of the dorsum. The **mantle** has a thickened edge anteriorly and dextrolaterally (mainly following the lip of the shell. At the rear the mantle flares out into a **posterior mantle lobe**; of which the central portion is elongated into a **pseudo-metapodium** that coils into the involute spire. There is always a black, heavily **pigmented spot** on the mantle on the right side of the animal just forward of the posterior lobe. There is a **spermatothecal groove** on the dorsal surface of the right-hand parapodial lobe.



Parvaplustrum sp. A, FIGURES a-f. [a] dorsum with liver dark; [b] ventrum with dark liver, note thickened lip of mantle; [c] underside of head and foot with long threadlike metapodium, note contracted metapodium; [d] frontal view of head; [e] side view of head with one palp and two cephalic tentacles; [f] palp, lateral view.







Bullomorpha sp. A , FIGURES 1-3: *Fig.* 1: Dorsal view with shell, pigmented spot showing through; *Fig.* 2: Ventral view; *Fig.* 3: View of right side of animal. no shell.

Cephalaspidea and gizzard plates

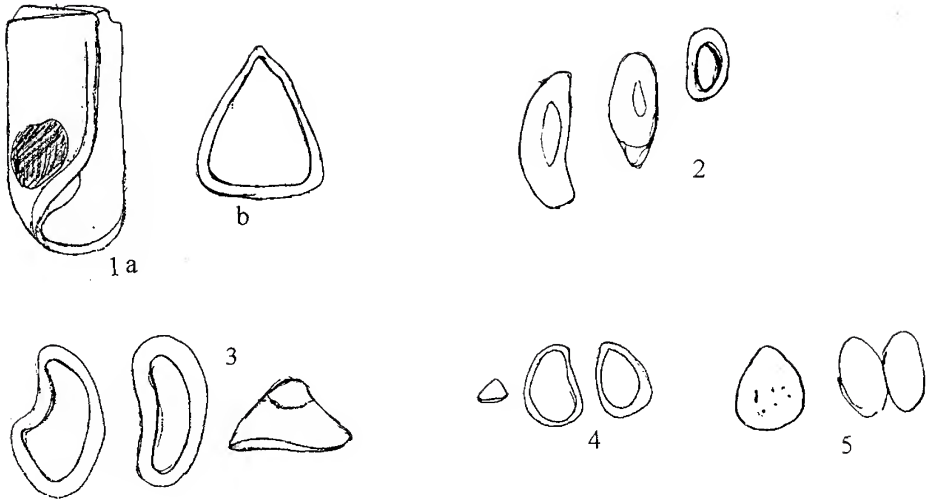
Many genera of Cephalaspideans posses gizzard plates and it is unfortunate that their exact relevance to taxonomy at higher levels will remain nebulous until more work is done. Somewhere along the length of the digestive tract, and posterior to the buccal bulb, the heavily reinforced sac which contains the gizzard plates can be found. The buccal bulb contains the radula, which is generally not that difficult to find and prepare for the microscope. Far easier to find, however, are the gizzard plates.

There are usually three plates composed of a tough, horny material that is dark and translucent. Each plate abuts the other two on its inner grinding face, while its back is embedded in the tough ligaments of the sac. The presence or absence of gizzard plates is most certainly of importance at the generic level i.e. all the species in a genus are alike in having or not having plates; usually their general shapes indicate a genus and the species are hard to differentiate except by very subtle variations. In genera such as *Cylichna* and *Philine* there are three equal (in size and shape) plates that are elongate, ovoidal, and flattened. In *Acteocina* and *Tornastra* (= *Acteocina*, in part) there are two equal paired plates and a third small plate of varied shape. In *Bulla* and *Haminaea* the three equal plates have their ends curled backward and their faces are adorned with a series of ridges for extra grinding efficiency. The shapes must reflect both the food item and the exact masticatory movements employed. Three equal, simple plates would seem to be the primitive condition with asymmetrical teeth (and masticatory patterns) arising later.

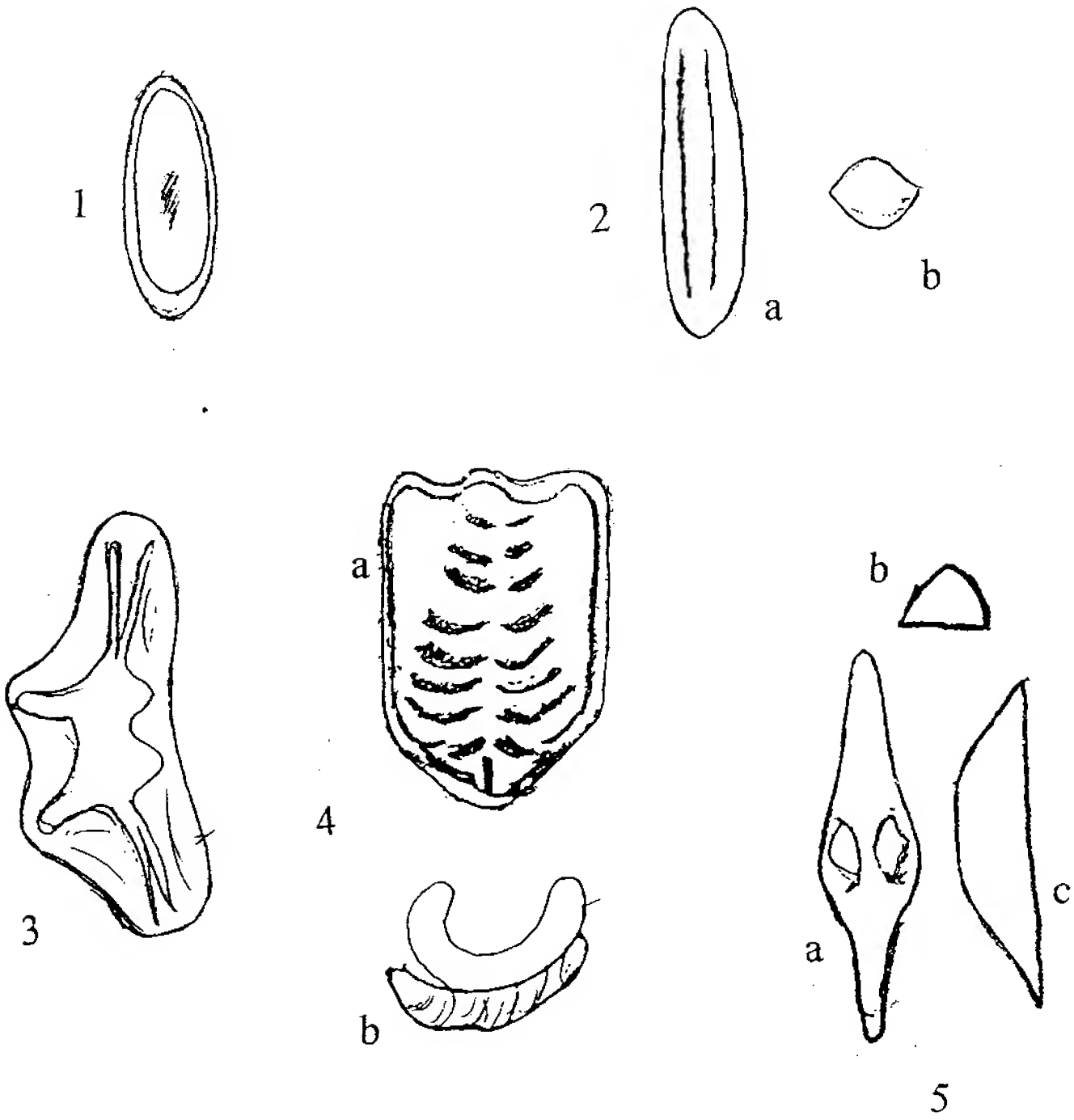
Locating gizzard plates

In benthic surveys, the most frequently encountered specimens are preserved rather than live animals, and therefore what follows refers to dead, contracted specimens. You will need a binocular microscope, very fine forceps and a small sharp scalpel.

Usually for the genera *Cylichna, Tornastra, Bulla, Haminaea, etc.*, the gizzard sac is located just below the shell under the portion of the body whorl adjacent to the anterior part of the aperture. If this region of the shell is broken away, at least the uppermost gizzard plate will become apparent and the entire sac can be lifted out using only forceps and digging a little. With inspection it can be seen where the plates separate and a few careful scalpel cuts will cut the binding ligaments exposing the individual plates. The plates in *Bulla* and *Haminaea* are so large and obvious almost any cut though the animal is sufficient to expose them. In *Philine* spp. the sac is along the midline of the body and a simple incision through the center will cut through flesh and then encounter the sac which can be teased out with forceps.



FIGURES 1-5: *Fig* 1: *Acteocina inculta,* [a] dark area shows general location of gizzard plates; [b] unpaired gizzard plate; *Fig.* 2: *Tornastra cf. cerealis*, ala Marcus via MacLean, size 0.4-0.8 mm in length; *Fig.* 3: *Acteocina harpa*, size of longest plate about 0.6 mm; *Fig.* 4: *Tornastra cerealis/culcitella/eximia*, according to McLean, size unknown; *Fig.* 5: *Sulcoretusa xystrum*, size about 0.16 x 0.32 mm.



FIGURES 1-5. *Fig.* 1: *Cylichna diegensis*, size 0.9 x 0.4 mm, grinding face; *Fig.* 2: *Philine* sp. A, size 0.86 x 0.24 mm, [a] grinding face, [b] cross section; *Fig.* 3: *Bulla gouldiana*, size 5 mm in length, grinding face with central callous; *Fig.* 4: *Haminaea* spp. (generalized), size 1.8 x 1.3 mm, [a] grinding face with transverse ridges, [b] side view of plate with translucent, cartilaginous "backing plate".; *Fig.* 5: *Philine auriformis*, size 3.1 mm in length. [a] gringing face, [b] cross section, [c] side view.

PARAPRIONOSPIO

CHARACTER	AFRICANA Augener 1918	ALATA Moore 1923 (Pt. Pinos)	COORA Wilson 1990	LAMELLIBRANCHIA Hartman 1974
Prostomium shape	clearly pointed anterior	anterior blunt, slightly rounded	rounded anteriorly, spindle-shaped	rounded in front
No. of branchial pairs		3 pairs		3 pairs
Branchial lamellae		double row of pinnae on caudal face	basally bifoliate, then flabellate	bifoliate, each lamellae penetrated by 3 vascular loops
Notopodial lobes		1st. rudimentary; 2-5 then palatte-shaped, with broad free ends covering the back; after 5 gradually reducing, by set. 24 only small, flattened lobe	elongate triangular lobes longest set. 1-4; then reducing in size but remaining dorsally acuminate; elongate subulate by set. 20, then ciriform by set. 35	1-5 large, triangular, increasing in size thru set. 2-3 & then diminishing thru several segments until rounded lobes
1st branchiae with anterior basal lamellae		not mentioned	several, triangular, on anterior surfaces	not mentioned
Papillae on posterior margin of peristomial wings		not mentioned	yes, small	not mentioned
Filament at base of 3rd branchiae		not mentioned	no	no
Transverse dorsal crests		not mentioned	no	no
Lateral anal cirri		incomplete	yes, may be extremely fine	no
Neuropodial hooks begin; # of pairs of apical teeth		somite 20	set. 9; 2 prs., with internal striate hoods	set. 9; 2 prs; internal hood not mentioned or illustrated
Notopodial hooks begin; # of pairs of apical teeth		not mentioned; up to somite 50 with only capillaries	set. 38-41; 2 prs. shown in ill; internal striate hoods	pasl postmedian parapodia; 2 prs; no mention of internal hood
Smooth, nonlimbate capillaries completely replace granulate limbate neurosetae by		not mentioned	appear at set. 9, replace smooth by set. 13	not mentioned
Smooth nonlimbate capillaries completely replace granulate limbate notosetae by		not mentioned	replaced by set. 24	not mentioned
Sabre setae begin		not mentioned	set. 9	present, but not specified
Ventral bilobed flap in set. 8		not mentioned	no	not mentioned
Interparapodial pouches		not mentioned	begin set. 8/9 to 13/14 (0.9 mm wide), up to 20/21 (1.8 mm wide)	present in larger worms, from set. 10-1 to 19-20, best developed at set. 16-18
Transverse dorsal ridges		not mentioned	set, 13-16; about 13-15 lighter colored, 2-3 per setiger	not mentioned
Dorsal glandular rings		not mentioned	not mentioned	not mentioned
Transparent cuticular areas on dorsum		not mentioned	no	not mentioned
Pigment spots on peristomium		not mentioned	can be present or absent	not mentioned
Ventral groove		not mentioned	not mentioned	not mentioned
Specimen size		head+53 seg, lnc.: 29x1.6 mm	46 set. com.: 8x0.4mm 37 set. inc.: 19x1.6mm	141x2.0 mm for ___ set
Specimen locality		Pt. Pinos, CA	New South Wales; Tasmania	Mozambique Channel & northern Indian Ocean

PARAPRIONOSPIO

CHARACTER	PINNATA sensu Day	PINNATA sensu Fauvel 1932 (India)	PINNATA (Iranian Gulf) sensu Wesenberg-Lung 1949	PINNATA INAEQUIBRANCHIA Caullery 1914	PLUMOSA Treadwell 1931 (Chesapeake)
Prostomium shape		not mentioned	rounded in front		rounded anterior
No. of branchial pairs		3-4 prs, most with 4	3 pairs		"should be 3" pairs
Branchial lamellae	bifoliate	pinnate, nearly flabelliform gills	pinnate with 2 rows of pinnules		two rows of filaments, development variable
Notopodial lobes		not mentioned	III: 1-4 large, lanceolate		flattened cirrus-like lobe, largest on set. 1-3, then gradual decrease so they practically disappear by set. 8-10
1st branchiae with anterior basal lamellae		not mentioned	not mentioned		not mentioned
Papillae on posterior margin of peristomial wings		not mentioned	not mentioned		not mentioned
Filament at base of 3rd branchiae		yes, often very small	yes, #. shows 1 filament on left side & 2 on right side	yes	not mentioned
Transverse dorsal crests	set. 21-30	1 female w/ eggs had crests on 21st-25th	whitish crest, seg. 11-17, on some sexually mature worms		not mentioned
Lateral anal cirri		not mentioned, median only	not mentioned, only median		incomplete specimens
Neuropodial hooks begin; # of pairs of apical teeth		not mentioned	set. 9; teeth & internal hood not mentioned	4 prs	set. 9; row of 3 smaller teeth above large subterminal tooth; double hood present
Notopodial hooks begin; # of pairs of apical teeth		not mentioned	not mentioned		posterior; resemble those of anterior neuropodia
Smooth, nonlimbate capillaries completely replace granulate limbate neurosetae by		not mentioned	not mentioned		not mentioned
Smooth nonlimbate capillaries completely replace granulate limbate notosetae by		not mentioned	not mentioned		not mentioned
Sabre setae begin		not mentioned	not mentioned		not mentioned
Ventral bilobed flap in set. 8		not mentioned	not mentioned		not mentioned
Interparapodial pouches	lacking	not mentioned	not mentioned		not mentioned
Transverse dorsal ridges		not mentioned	not mentioned		not mentioned
Dorsal glandular rings		not mentioned	not mentioned		not mentioned
Transparent cuticular areas on dorsum		not mentioned	not mentioned		not mentioned
Pigment spots on peristomium		not mentioned	not mentioned		not mentioned
Ventral groove		not mentioned	not mentioned		not mentioned
Specimen size		not mentioned	not mentioned		15x0.6mm incomplete
Specimen locality		India, Burma	Iranian Gulf		Chesapeake Bay

PARAPRIONOSPIO

CHARACTER	PINNATA sensu Wilson 1990 (LECTOTYPE)	PINNATA Foster 1966, 1971 (mixed)	PINNATA sensu Blake 1995 (MMS/ Wilson)	PINNATA sensu Maciolek (1985 mixed/Foster)
Prostomium shape	truncate to slightly rounded anteriorly	very narrow tapered cylinder to spindle-shaped	expanded slightly & rounded on anterior margin	spindle-shaped
No. of branchial pairs	3 pairs	3 pairs	3 pairs	3 pairs
Branchial lamellae	all bifoliate	pinnate (figs. of adult branchiae show bifoliate basally, foliate medially & distally)	bifoliate	large plate-like pinnules
Notopodial lobes	longest on set. 2-4; then becoming low rounded lobes to about set. 22, then lanceolate to at least 35	lanceolate on set. 1-5; post. to set. 5 increasingly rounded; then become long & thin until acuminate	longest on set. 2-4, triangular; reduced, low & rounded to about set. 20; then lanceolate to end	largest on set. 1-5, foliose; becoming smaller on subsequent setigers (no mention of later enlargement)
1st branchiae with anterior basal lamellae	no	not mentioned	not mentioned	not mentioned
Papillae on posterior margin of peristomial wings	no	not mentioned	no	not mentioned
Filament at base of 3rd branchiae	no	in some specimens	no, except on largest specimens	not mentioned
Transverse dorsal crests	no	not mentioned	sometimes set. 21-28	not mentioned
Lateral anal cirri	no	yes	yes	yes
Neuropodial hooks begin; # of pairs of apical teeth	set. 9; 3 prs., with internal striate hoods	set. 9; ill. shows both 3 prs. & 4 prs.; internal striate hoods	set. 9; 3 prs.; with internal striate hoods	set. 9; 4 prs.; secondary hood present
Notopodial hooks begin; # of pairs of apical teeth	set. 33; 3 prs. in ill.; internal striate hoods	posterior to set. 19; nr. prs. not given; internal striate hoods	set. 32-50, size-dependant	set. 20; 4 prs.; secondary hood present
Smooth, nonlimbate capillaries completely replace granulate limbate neurosetae by	transition set. 10-15	not mentioned	first appear set. 9	not mentioned
Smooth nonlimbate capillaries completely replace granulate limbate notosetae by	transition set. 10-15	not mentioned	not mentioned	not mentioned
Sabre setae begin	broken off on lectotype	set. 9	set. 9	set. 9
Ventral bilobed flap in set. 8	no	not mentioned	not mentioned	not mentioned
Interparapodial pouches	no	some specimens: pouches or thin membranes accompanying clear hyaline circles, start about set. 20	no, but set. 4-8 with enlarged swellings	no
Transverse dorsal ridges	not mentioned	not mentioned	not mentioned	not mentioned
Dorsal glandular rings	not mentioned	not mentioned	set. 12-16	not mentioned
Transparent cuticular areas on dorsum	semi-transparent patches dorsal cuticle set. 21-35	beginning about set. 20 on some specimens	set. 21-28	not mentioned
Pigment spots on peristomium	no	occasionally 2 diffuse areas	can be present or absent	not mentioned
Ventral groove	shallow depression on set. 1-20, then deep groove	not mentioned	shallow, deepening towards posterior	not mentioned
Specimen size	35 set. inc.: 16x2.0 mm, female lectotype	122 set.; up to 48 mm long	largest 120 set, 65x1.5 mm	not mentioned
Specimen locality	Lectotype - Chile	cosmopolitan	MMS material	cosmopolitan

PARAPRIONOSPIO

CHARACTER	TREADWELLI (= plumosa) Hartman 1951 (east coast)	TRIBRANCHIATA Berkeley 1927 (Nanoose Bay)
Prostomium shape	not mentioned	rounded anteriorly
No. of branchial pairs	4 pairs	3 pairs
Branchial lamellae	branchiae pinnately divided	about 60 transverse pinnae on posterior face, projecting on both sides
Notopodial lobes	not mentioned	1-5 largest, lanceolate; diminish & become more rounded until set. 22, when becmes lanceolate again
1st branchiae with anterior basal lamellae	not mentioned	not mentioned
Papillae on posterior margin of peristomial wings	not mentioned	not mentioned
Filament at base of 3rd branchiae	not mentioned	not mentioned
Transverse dorsal crests	not mentioned	not mentioned
Lateral anal cirri	not mentioned	no complete specimens
Neuropodial hooks begin; # of pairs of apical teeth	set. 9; uniseral row of several smaller teeth; internal hood not mentioned	somite 10 (setiger 9); 3 secondary hooks; internal hood not mentioned
Notopodial hooks begin; # of pairs of apical teeth	"segments far back"; uniseral row of several smaller teeth; internal hood not mentioned	posterior somites; # teeth & internal hood not mentioned
Smooth, nonlimbate capillaries completely replace granulate limbate neurosetae by	not mentioned	not mentioned
Smooth nonlimbate capillaries completely replace granulate limbate notosetae by	not mentioned	not mentioned
Sabre setae begin	set. 9	somite 10 (set. 9)
Ventral bilobed flap in set. 8	not mentioned	not mentioned
Interparapodial pouches	not mentioned	not mentioned
Transverse dorsal ridges	none	not mentioned
Dorsal glandular rings	not mentioned	not mentioned
Transparent cuticular areas on dorsum	not mentioned	not mentioned
Pigment spots on peristomium	not mentioned	yes
Ventral groove	not mentioned	not mentioned
Specimen size	15 to 30–40 mm	head+29 seg: 31 mm (type)
Specimen locality	Maryland, North Carolina, Louisiana	Nanoose Bay, B.C.

PARAPRIONOSPIO

CHARACTER	FORM A Yokoyama & Tamai 1981	FORM B Yokoyama & Tamai 1981*	FORM CI Yokoyama & Tamai 1981	FORM CII Yokoyama & Tamia 1981
Prostomium shape	bluntly pointed to round or truncate	round anterior end	round or bluntly pointed	round or bluntly pointed end
No. of branchial pairs	3 pairs	3 pairs	3 pairs	3 pairs
Branchial lamellae	all bifoliate, attached serially in 2 rows; w/ reticulated vascular tract within lamellae	bifoliate proximally; flabellate medially & distally; serial rows	bifoliate proximally, flabellate medially & distally	bifoliate proximally, flabellate medially & distally
Notopodial lobes	lanceolate, distally pointed; reduce in size, become rounded after set. 4; become acuminate in posterior	long, distally tapered; reduce in size, become low & rounded after set. 4; posteriorly subtriangular to lanceolate	long, foliaceous, distally pointed; after set. 4 gradually rounded; posterior to set. 10 increasingly elevated	lanceolate with tapered end; after set. 4 gradually reduced & rounded; posteriorly become blade-like
1st branchiae with anterior basal lamellae	no	no	yes - several, triangular	yes, 1-5
Papillae on posterior margin of peristomial wings	yes, small	no	yes	yes
Filament at base of 3rd branchiae	yes, length variable	yes	no, but occasionally very small protruberance	yes
Transverse dorsal crests	set. 21-36	no	no	no
Lateral anal cirri	yes	yes	yes	no
Neuropodial hooks begin; # of pairs of apical teeth	set. 9; 3 prs.; with internal striate hoods	set. 9; 3 prs; with striate internal hoods	set. 9; 3 prs., with internal striate hoods	first appear posterior to set. 9; 3 prs.; internal striate hoods
Notopodial hooks begin; # of pairs of apical teeth	usually set. 35 (posterior to set. 31-36); 3 prs; internal striate hoods	posterior to set. 36-42; 3 prs; with striate internal hoods	posterior to set. 24-54; 3 prs; internal striate hoods	posterior to set. 34-42; 3 prs; internal striate hoods
Smooth, nonlimbate capillaries completely replace granulate limbate neurosetae by	first appearance set. 10	first appear at set. 9	first appear at set. 9	first appear set. 9
Smooth nonlimbate capillaries completely replace granulate limbate notosetae by	posterior to middle body region	first appear at set. 9	posterior to set. 16	set. 9
Sabre setae begin	set. 9	set. 9	set. 9	set. 9
Ventral bilobed flap in set. 8	no	yes	no	no
Interparapodial pouches	no	usually from set. 9 (8-10), variable, up to set. 42	on some specimens, usually begin set. 8(7-9), thru variable number of setigers	yes; first occurrance variable, from set. 4 to 15
Transverse dorsal ridges	not mentioned	not mentioned	not mentioned	not mentioned
Dorsal glandular rings	not mentioned	not mentioned	not mentioned	not mentioned
Transparent cuticular areas on dorsum	set. 21-36, with dorsal crests, with many concavities	set. 21-36	not found	set. 21-31
Pigment spots on peristomium	no	no	yes	yes
Ventral groove	not mentioned	not mentioned	not mentioned	not mentioned
Specimen size	114 set.: 81 mm	94 set: 37 mm	120 set.: 70 mm long	98 set.: 65 mm long
Specimen locality	Japan	Japan	Japan	Japan

Southern California Association of
Mostly Inveterate Twits

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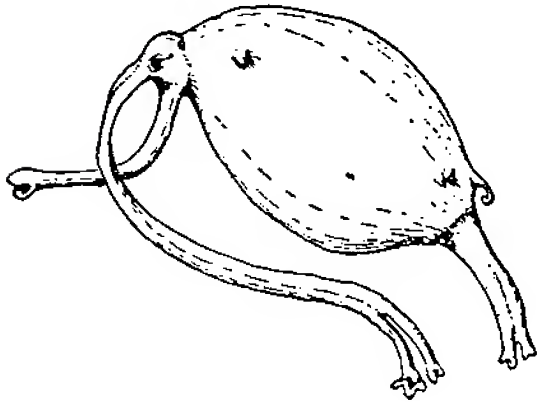
Beverly Hills, California 90210

April 1, 1996 SCAM IT Newsletter Vol. 14, No.13

NEXT MEETING:	Rhinigrades
GUEST SPEAKER:	J. Durante
DATE:	31 June 1996
TIME:	9:30p.m.-3:00a.m.
LOCATION:	Los Angeles County Arboretum



Rhinotaenia tridacnae(from Stümpke, Harald. 1967. The Snouters. Natural History Press, Garden City. 92pp)

Our next meeting will deal with the obscure proboscidean group Rhinogradentia (snouters). As only a few of the members of the group are actually invertebrates, no complete treatment is contemplated. Dr. Durante is a respected authority on proboscides, and we are glad to welcome him back. None of us have had the joy of actually finding a snouter in one of our routine monitoring samples, but they have been reported regardless. If you have specimens, please bring them to the meeting. Any of the older and less accessible literature would also be useful. Don Cadien will, as usual, bring as much of the literature as he can carry. Since interest in this group is likely to extend beyond SCAM IT members alone, please invite anyone

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who expresses interest to the meeting. Visits by Dr. Durante are rare events.

ELECTION RECOUNT

After a request by an irate Newsletter reader, the ballots of the recent election were actually opened and counted. The officers are embarrassed to correct the earlier report of their re-election, and to welcome the new slate of officers. Although a variety of write-in candidacies were put forward, the winners were Mas Dojiri, President; Dan Quayle, Vice-President; Fawn Hall, Secretary, and Charles Keating, Treasurer. Since some of those elected are not even members of the organization, their election is held in abeyance until they pay their dues, and/or are released on bail.

A SERIOUS DEVELOPMENT

The flesh-eating strain of *Staphylococcus* bacteria which has received press of late for attacking humans and providing extensive (if unwanted) weight loss has now been reported from the marine environment. Recently several of the tanks at the Cabrillo Marine Aquarium have shown evidence of the presence of this pathogen, with fish on display virtually vanishing before the eyes of an astonished public. Chief Aquarist Jeff Landesman is at a loss as to how to purge them from the sea-water system without killing off the rest of the displays. However, since there is a long-standing policy of purges at the aquarium, one will be performed without delay. An alternative view of these losses is provided by an undisclosed source within the institution which maintains the aquarist himself is responsible for them.

A new display and touch-tank allowing the public to view and interact with these bacteria is planned for late 1996. Mayor Riordan is scheduled to give a hands on demonstration of the new exhibit, but pressures of his re-election campaign may force delegation of this public relations plum to a lower ranking representitive.

NEW LITERATURE

The first complete census of any biological system has been completed and has just been published in National Biosystems Review (NBR Vol 31(3): 118-120). It covers the shallow-water marine environment of the Palos Verdes Peninsula. Authors Rim Fay and Tom Hayden report the area a "biological desert" in which absolutely nothing lives. These findings are disputed by some, but have been warmly received by the inshore gill-net fisherman, who plan to use the report in court to demonstrate that their white croaker could not have come from the closed fishery area.

A second complete inventory is nearly done. It covers one square centimeter of the forest floor in the Chitarra Provincial Park in northern Costa Rica. After herculean efforts by the bacteriologists and virologists of the National Centers for Disease Control, the protist portion of the report nears completion. Printing and distribution of the anticipated 23,000 pages of inventory is expected to delay its availability.

The picture regarding *Capitella* has become more complicated. A series of genetic investigations on materials from around the world (Preebie and Sexsmith, 1996. Chromosome topology in a marine annelid species complex. Journal of Disturbed Ecosystems 4(11):74-131) has shown that there are another nine species of *Capitella* "capitata" which differ in their chromosome complement, size, and shape, but are morphologically identical. Pure colonies have been established through parthenogenetic breeding, and investigations to determine their behavioral and reproductive differences are now underway.

This month brings to light yet another of the ongoing series of cladistic reexaminations of the

interrelationships of deuterostome groups. Snead and Jocich (1996. Interrelationships of deuterostome groups: new results and invalidation of past efforts. Journal of Communicable Results 10(2):311-333) report their careful preparation has shown character states used in previous analyses cannot logically be used. They have been unable to generate additional character states which are valid bases for analysis and have declared, therefore, that the deuterostome groups are not related to each other.

NEW LEGAL PRECEDENT

An appeals court in Wisconsin has recently rendered a decision relating to the definition of "fair use" under the copyright law which has the potential of impacting any person who uses photo-reproduction of copyrighted material. Judge Emil Nightraid's decision states, in effect, that possession of copyright restricts usage of the material to the copyright holder; that these rights cannot be distributed or assigned, and that consequently any material protected by copyright is unavailable to anyone other than the holder of the copyright. Further appeals are planned.

MAD COW DISEASE

Report all cases immediately: the importance of quick action cannot be overemphasized! Happy cows need not be reported. However attempts to use happy cows for food has been known to anger them. Do not report cases of angered happy cows as mad cow incidents. Penalties will be in place for false reporting, so please have the facts straight.

MINUTES OF THE 1 APRIL MEETING

None of the officers were able to make the meeting. Reports are that the two people who did attend got tired of waiting for the meeting to be called to order and wandered off. Anyone with information as to their whereabouts please contact the authorities.

SCAM IT OFFICERS:

If you need any other information concerning SCAM IT please feel free to contact any of the officers.

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Single back issues are also available, but you can't afford them.